



DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LT. GOVERNOR

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SECRETARY

The Commonwealth of Massachusetts
Executive Office of Public Safety and Security
Department of Fire Services

P.O. Box 1025 ~ State Road

Stow, Massachusetts 01775

(978) 567~3100 Fax: (978) 567~3121

www.mass.gov/dfs



STEPHEN D. COAN
STATE FIRE MARSHAL

ADVISORY

TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: June 1, 2011

SUBJECT: **Contact Number for July Fourth Holiday**

The summer fireworks season is fast approaching. Final plans for Fourth of July fireworks displays are taking place and precautionary planning becomes increasingly important. Advance planning is necessary for our agency to respond appropriately should problems be encountered the day or evening of the display. While the primary concern is the prevention of accidents that have the potential to injure, other issues of non-compliance may occur on the day of the display.

The Division of Fire Safety grants natural barrier approvals when needed. If you previously received an approval and nothing has changed in the plans submitted to you by the fireworks shooter, you do not need another approval. If you need a site inspection for approval, please contact 978-567-3375 as soon as possible.

Once again, it is strongly recommended that the same procedures used last year be followed again this year. A representative of your department should take a close look at the display during the setup process during daylight hours in the late afternoon. This procedure provides the best opportunity to inspect and correct any compliance issues and insures a safe and successful fireworks display.

Please be assured that, once again, the Department of Fire Services, Division of Fire Safety, stands ready to provide the highest possible level of technical, compliance, and enforcement support during this long and important holiday week. In an effort to provide additional inspection guidelines, please find attached to this memo a suggested checklist for the three stages of a

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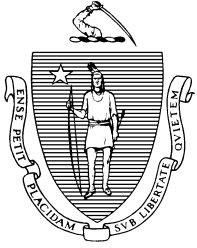
fireworks program. If you have any questions about Users Certificates, Certificates of Competency, or related licensing issues, please contact our Licensing Desk at 978-567-3700.

In order to address the potential need for compliance and enforcement support during the long July Fourth holiday, Division of Fire Safety Code Compliance and Enforcement Officers will be available, 24 hours a day, to respond to your communities should the need arise.

Should it be necessary during a pre-display setup inspection by your department, or an accident, to contact a Code Compliance and Enforcement Officer, the following numbers may be called for immediate assistance (be prepared to provide your contact information and details on the nature of the request):

**Outside of regular business hours, you should call the Massachusetts
Emergency Management Agency at 508-820-2000.**

**Normal business days from 8:00 a.m. to 4:00 p.m., please call the Division of
Fire Safety at 978-567-3375.**



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FIREWORKS DISPLAY CHECKLIST

Date of Show: _____

Before Show /check:

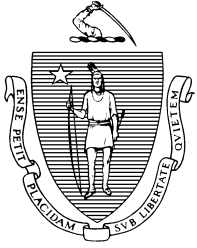
- ☐ Pre show site inspection.
- ☐ Natural barriers must be pre-approved by the State Fire Marshal's Office (plan sufficient time ahead)
- ☐ At least 20days prior to display application/permit must be submitted, including site diagram and shell inventory, by a licensed competent operator.
- ☐ Obtain copies of all State Fire Marshal permits if applicable such as transportation, electrical firing board, portable firing trailers, 12-inch shells.
- ☐ Within 5 Days of receipt of application/permit, form must be approved or disapproved and forwarded to the State Fire Marshal's Office.

Day of Show /check:

- ☐ Establish secured area with a suitable barrier such as snow fencing or equivalent (caution tape is not sufficient), natural barriers, as approved by SFMO (secured area must be established and maintained from the arrival of the fireworks until the completion of the display).
- ☐ Verify State Fire Marshal permits (transportation, electric firing boards, and portable firing trailers).
- ☐ If using racks, determine that the rack placement conforms to the approved site.
- ☐ Check racks for correct spacing and stability. Check angling of mortars.
- ☐ If not using racks, determine that tubes are sufficiently buried. Check angling of mortars.
- ☐ Determine weather and wind condition prior to display.

Following the Show /check:

- ☐ A competent operator must insure a search is made for any unignited shells immediately following the display and at the first available daylight.
- ☐ Upon completion of the search, a competent operator shall report all findings to the head of the Fire Department.



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STEPHEN D. COAN
STATE FIRE MARSHAL

MEMORANDUM

TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: June 1, 2011

SUBJECT: Information from DEP regarding perchlorate-containing fireworks

Attached for information purposes only, is a memorandum from the Department of Environmental Protection. DFS will provide this memorandum to all firework user certificate holders issued by our office. The purpose of this memorandum is to bring attention to the recent contamination of drinking water supplies by perchlorates. While there is no specific link identified at this time, DEP has requested assistance in getting this information out regarding the need for housekeeping and alternatives in certain areas.

If you have any questions contact technical services unit at 978-567-3375 or in western MA at 413-587-3181.

Attachment

Fireworks Best Environmental Management Practices

Memorandum

To: Fireworks Contractors and Interested Parties

From: Janine Commerford, Assistant Commissioner - Waste Site Cleanup

Subject: Potential Environmental Contamination From the Use of Perchlorate-Containing Fireworks

Date: May 19, 2011

Introduction

Over the past few years, the Massachusetts Department of Environmental Protection (MassDEP) has detected perchlorate in a number of drinking water supplies in Massachusetts, including several public water supply wells where nearby fireworks displays appear to be a source of the perchlorate contamination. The purpose of this memorandum is to provide guidance on perchlorate-containing fireworks to prevent contamination of drinking water supplies from this potential source.

Background

Perchlorate is a chemical compound comprised of 1 chlorine and 4 oxygen atoms. The wide-scale production of perchlorate for use as a solid rocket propellant has led to the use of perchlorate compounds in a number of common products, including airbag inflators, industrial chemicals, explosives, and fireworks. Perchlorate is highly water soluble, and can travel significant distances in groundwater. Perchlorate can affect the function of the thyroid gland, which regulates the body's metabolism. Pregnant women and their fetuses, infants, children under the age of 12, and people with hypothyroidism are most susceptible. In July 2006, MassDEP promulgated a drinking water standard of 2 parts per billion or ppb, and notification criteria (Reportable Concentrations in soil and groundwater) for this contaminant under the state waste site cleanup regulations (Massachusetts Contingency Plan, 310 CMR 40.0000).

In response to detection of perchlorate in water supply wells in Massachusetts, MassDEP is investigating surrounding sites and activities that may have caused or contributed to contamination. Fireworks displays employing perchlorate-containing pyrotechnics have been identified in at least three locations as the possible source of drinking water contamination.

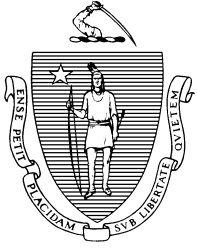
Recommendations

Although the environmental impacts from the use of perchlorate-containing fireworks have not been fully defined, MassDEP believes it is prudent for fireworks contractors to take the

following reasonable steps to minimize potential problems:

1. Request low (or no) perchlorate containing fireworks. This may require that you make inquiries with your suppliers and/or manufacturers.
2. Institute rigorous "housekeeping" practices. It appears that the deposition of unburned aerial shell fragments and other pyrotechnic debris may be the primary mechanism by which groundwater becomes contaminated by perchlorate. Fireworks companies or display sponsors should remove all visible shell debris encountered during the search at first light.
3. Dispose or manage "duds" and "misfires" appropriately; all "duds" or "misfires" must be removed from the site and disposed of in accordance with applicable codes and manufacturers instructions. Contain and/or promptly address runoff in cases where water is used to douse duds or misfired materials.
4. Be aware of the existence of surrounding drinking water supplies and stay as far away from them as possible. Of particular concern are Fireworks displays within the recharge areas of public drinking water supply wells (i.e., "Zone II" and "Interim Wellhead Protection" areas). Maps of these areas and surface water supplies should be available from local officials, and can be viewed on-line at <http://www.mass.gov/mgis/> (specifically <http://maps.massgis.state.ma.us/WSPA/viewer.htm>) and <http://mass.gov/dep/water/drinking/swapreps.htm>

Please contact Rose Knox at the MassDEP Bureau of Waste Site Cleanup (BWSC) at 617-556-1026 or Rosemary.Knox@state.ma.us if you would like additional information, or please refer to the following link on MassDEP's Website:
<http://mass.gov/dep/water/drinking/percinfo.htm>



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TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: June 1, 2011

SUBJECT: **Chemical Suicide**

This memo (originally issued in July 2010, is being reissued in light of the recent incidents of chemical suicide throughout the Commonwealth)

Suicide by toxic gas has become an increasingly common method for ending one's life and poses **immediate and serious danger to first responders**. The primary product in this emerging trend for suicide has been Hydrogen Sulfide, produced from readily available household products. The trend originated in Japan and has become more widespread, presumably, through the proliferation of information via Internet "suicide bulletin boards." This method of suicide is becoming common in the United States with recent incidents throughout the country including two in New York State and one episode reported to have occurred in a Massachusetts community on board a ship.

Responders should be aware that these situations commonly occur in vehicles, residential bathrooms and other small confined spaces, where a small amount of gas can quickly reach lethal concentrations. Early reports from Japan, as well as reports of such suicide acts in the United States, have taken place in motor vehicles with clearly posted warnings to responders. More recently, Japan has seen episodes of Hydrogen Sulfide suicide in buildings. While vehicle executed suicide poses limited risk to the public, such actions taken in buildings, offer greater risks to the public and first responders. Dispatchers and call takers should warn callers not to approach or enter vehicles, rooms or apartments where chemical suicide may have been attempted.

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Indicators of a Chemical Suicide

- Individuals who initiate chemical suicide may, or may not, place warning signs on doors or windows to indicate the presence of deadly gas inside the space. Signs may not be easily detected, or understood, by other people – including responders! Signs may be hidden or obscured by condensation, frost, snow or vapors produced by the reaction. Interview anyone who may have approached the scene to learn what they saw or smelled. A “rotten egg” smell would indicate hydrogen sulfide; an almond odor is typical of cyanide compounds.
- Look for indications that a chemical reaction has been initiated. Typically you will find containers of household chemicals and pails, buckets, pots or other containers where chemicals could have been mixed. There is a possibility that improvised “containers”, such as a sink or the glove box of an automobile, could be used to mix the chemicals. If you can clearly see that there are no chemical containers and mixing containers present anywhere in the space it is probably not a chemical suicide.
- Written warning – Including signs as described above or suicide notes that may detail the intended method.
- Suicide in a small space – such as a car, bathroom, closet, trailer
- Sealed environment – A suicide room or car may be sealed up with plastic, duct tape or weather stripping.
- Precursor Chemicals – Acids (organic (fruit juice) or inorganic (muriatic)), sulfur based products such as rust and lime remover, Zinc Sulfate, certain pesticides.

About Hydrogen Sulfide (H₂S)

Hydrogen Sulfide gas has been a long known toxic gas, being the principal culprit of “sour gas” wells. Hydrogen Sulfide is also a principal concern in confined space rescue. The gas is produced for suicide purposes by mixing a sulfur containing product, such as detergent, certain pesticides or cleaners with an acid, such as Muriatic (Hydrochloric) acid, or Zinc lime cleaner and acid, or even aluminum sulfide in water. The presence of these materials near a reported suicide, or other response where the welfare of a reported unseen person or unconscious person should raise consciousness and caution.

Hydrogen Sulfide is a colorless gas with an odor resembling rotten eggs or sewer gas. It may occur naturally or in industrial or waste management settings from the decomposition of organic materials. Encountering very high levels or prolonged low-level exposure will desensitize workers to its odor. Hydrogen sulfide has an Immediately Dangerous to Life and Health (IDLH) level of 100 parts-per-million (PPM), a level easily achieved in a closed vehicle with small quantities of precursor chemicals.

Hydrogen Sulfide carries an NFPA 704 Health Risk rating of 4. The primary hazards of Hydrogen Sulfide are respiratory. Though some skin and eye contact hazards exist, skin hazards are largely associated with contact of Hydrogen Sulfide in its liquefied compressed gas state, causing frostbite¹. Respiratory hazards are extensive, including at various levels of exposure: irritation, cough, lack of sense of smell, sensitivity to light, changes in blood pressure, nausea, vomiting, difficulty breathing, headache, drowsiness, disorientation, hallucinations, pain in extremities, tremors, visual disturbances, suffocation, pulmonary congestion, coma, death².

Hydrogen Sulfide carries a high flammability risk, also rated at 4 on the NFPA 704 diamond. Hydrogen Sulfide has a lower explosive limit (LEL) of 4% (40,000 ppm) and an upper explosive limit (UEL) of 44%³. The flammability poses risk to responders in the use of rescue tools to gain entry and where used in buildings or used in vehicles when the ignition and/or accessory switch may have been left on. One law enforcement bulletin on the subject raises concern on a larger scale, surmising that Hydrogen Sulfide may be generated as a booby trap against police entry teams when flash-bang devices are deployed. While many scenarios can be hypothesized, the flammability and thereby explosive potential should be clearly considered to be as high of a risk as that of toxicity. Initial size-up of a suicide or attempted suicide by H₂S should clearly and specifically identify ignition sources and provide protection against ignition.

Examples of household products used to produce H₂S are shown in the following table⁴

Acid Sources	Sulfur Sources
Lysol® Ready –to-Use disinfectant (4%-8% citric and hydroxyacetic acid)	Artist oil paints (up to 15% zinc sulfide)
Lysol® Toilet Bowl Cleaner (9.5% HCl)	Dandruff shampoos (1% selenium sulfide)
Sno Bol ®Toilet cleaner (15% HCl)	Pesticides (5%-30% calcium polysulfides)
The Works ® Toilet Bowl Cleaner (15%-20% HCl)	Spackling paste (1%-2% zinc sulfide)
Blu-Lite ® Germicidal Acid Bowl Cleaner (20.5% phosphoric acid)	Some latex paints (6.6% zinc sulfide)
Kaboom ® Shower, Tub and Tile Cleaner (5%-7% urea-monohydrochloric acid)	Garden Fungicides (5%-90% sulfur)
Tile & Stone cleaners (1%-30% HCl)	

¹ Source CDC, NIOSH Pocket Guide to Chemical Hazards, 1995 edition

² Source Hydrogen Sulfide Material Safety Data Sheet, Matheson Tri-Gas, via internet

³ Source CDC, NIOSH Pocket Guide to Chemical Hazards, 1995 edition

⁴ Source New York State Office of Homeland Security, Advisory, 26 September 2008

Hydrogen Sulfide will not dissipate quickly after ventilation unless it is forced out of its containment. It has a Relative Gas Density (relative to air) of 1.19, meaning it is close in density to air and not prone to move much without air exchange. However, it will dissipate quickly in open air and if there is no further production as it has a vapor pressure of 13376 mm/hg, about 2 times that of ammonia or chlorine.

Approach and Detection

Caution should also be taken to avoid assuming that every chemical suicide is from Hydrogen Sulfide. Some chemical suicides have occurred using other chemicals, including **Hydrogen Cyanide**. Suicide by Hydrogen Cyanide has been seen in relatively recent history in Massachusetts and in Arizona.

Recommendations for respiratory protection in the emergency or IDLH environment are for self-contained breathing apparatus (SCBA) or supplied air systems^{5 6}. The chemical protective clothing (CPC) requirements for Hydrogen Sulfide, in this setting, are not specifically addressed under exposure guidance. Published guidance for this product recommends chemical protective clothing, but cites the risk as frostbite. As previously stated, this risk is associated with the industrial transportation and use of Hydrogen Sulfide as a compressed liquefied agent. However, this recommendation would tend to prevent a rapid rescue in structural fire fighting ensemble with SCBA.

In cases where the act of attempted suicide was witnessed and 911 called immediately, this lack of guidance may tend to inhibit or prevent a rescue and possible opportunity to save the victim. Accordingly, we have asked the Hazardous Materials Committee of the International Association of Fire Chiefs to investigate the CPC requirements and to put forth recommendations based upon such investigation. Other sources⁷ state that chemical protective clothing is unnecessary, as H₂S is not absorbed through the skin. This is consistent with guidance regarding H₂S encountered in the confined space environment and would support rescue from chemical suicide where H₂S is known to be the product used, in structural firefighting ensemble with SCBA.

Consistently, reports of suicide have been accompanied by clear warnings of the hazard, most specifically warning responders of the danger, the presence of H₂S and the need to call for Hazmat assistance. Confirmation of the presence of H₂S can be made if the precursor chemicals are present and by many responder detection devices. H₂S is a common sensor in “four-gas” meters providing both the level of H₂S and the percent of the LEL. Hydrogen Sulfide can be detected with photo-ionization detection (PID) meters with a 10.6 eV, or higher, bulb. Caution should be used in interpretation of the PID

⁵ Source CDC, NIOSH Pocket Guide to Chemical Hazards, 1995 edition

⁶ Hazmaster G3 Chemical Response Software

⁷ New York State Office of Fire Prevention & Control Hazardous Materials/Homeland Security Bureau
November 6, 2009

results; as such results will report a level of Volatile Organic Compound within its range, but are not specific to Hydrogen Sulfide and may be “seeing” something else.

Proper and safe management of suicide by Hydrogen Sulfide is, as are all emergencies, a matter of the assessment of many factors against plans, training and equipment. As a novel situation, at least thus far in Massachusetts, H₂S presents a series of relatively unknown risks. Communication and awareness of this emerging problem is a first step to meeting that challenge with the best possible results. When in doubt, request assistance from the district Hazmat Response Team.

Volumes of information and news reports of suicide by H₂S reside on the Internet and can be found using search term such as “suicide by Hydrogen Sulfide,” or H₂S Suicides. More information will be forwarded through the Department of Fire Services when actionable information becomes available.

(U//FOUO) Potential Use by Terrorists⁸

(U//FOUO) Terrorist training manuals have discussed using Hydrogen Sulfide gas in an attack. DHS/I&A and the JRIC assess that the chemical reactions described in the manuals are viable and would yield hydrogen sulfide, but no information indicates that a terrorist attack is imminent using this chemical

(U//FOUO) The “Mujahideen Poisons Handbook” describes producing hydrogen sulfide gas by reacting sodium sulfide and sulfuric acid.

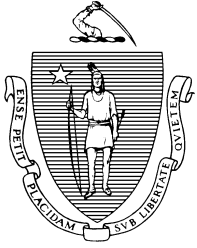
(U//FOUO) Another terrorist training manual proposes mixing hydrochloric acid and iron sulfide.

(U//FOUO) *DHS/I&A and the JRIC assess that it would be difficult for terrorists to create fatal concentrations of hydrogen sulfide in large open areas because the gas would dissipate; however terrorists could use it in enclosed spaces to cause disruption and panic, based on the circumstances of non-terrorist-related events.*

⁸ ibid

CONSIDERATIONS IN RESCUE AND RECOVERY

- Careful size up of any situation involving an unresponsive person in an enclosed space is critical for responder safety.
- Responders should wear SCBA and turn out gear whenever they are dealing with a suspected chemical suicide.
- Consider wind speed and direction when determining the need to evacuate nearby structures. In an apartment building consideration should be given to evacuating the entire building.
- If chemical containers are present attempt to identify the chemicals from labels on the containers, or a sales receipt. For Hydrogen Sulfide rescue can be made in Fire fighter Protective Ensemble (FFPE).
- The presence of containers of potassium cyanide, or cyanide compounds would indicate a reaction that produces hydrogen cyanide. This is less common than the hydrogen sulfide reaction as the cyanides are not as easily obtained. Rescue CANNOT be made in FFPE
- Air sampling equipment can be used to determine the presence, or absence of hydrogen sulfide or hydrogen cyanide. A small hole may be punched in a car or home window, or a probe, or colorimetric tube inserted in the gap between a door to the room and the floor. A hydrocyanic acid tube will detect hydrogen cyanide. Hydrogen sulfide is heavier than air (VD = 1.19), but hydrogen cyanide is slightly lighter (VD = 0.94) If the vapor in the space cannot be identified, or the presence of hydrogen cyanide is confirmed entry should only be made by individuals protected by fully encapsulated chemical protective clothing (level A). Hydrogen cyanide is Immediately Dangerous to Life and Health at concentrations above 50 parts per million.
- There have been no incidents of fire reported with these incidents and it is believed that concentrations do not typically reach the LEL except at close proximity to the mixing container. Responders should eliminate ignition sources when ever possible.
- The vapors inside the space should be ventilated to the outside. Ensure that no one will be endangered by the vapors before using natural or forced ventilation to air the space out. Anyone who has been exposed to the vapors should be decontaminated with soap and water. Clothing should be removed and double bagged. Contaminated clothing and PPE should be laundered before being reused. The victim should be stripped and decontaminated with soap and water before being transported from the scene. Deceased victims should be covered by a sheet, body bags are not recommended.



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MEMORANDUM

TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: June 1, 2011

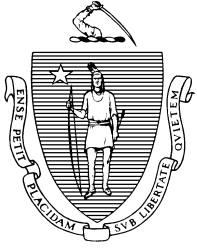
SUBJECT: Temporary Housing at Traveling Carnivals and Circuses

The Department of Fire Services is re-issuing this advisory due to recent issues associated with carnivals and circuses. The Department of Fire Services has become aware of potentially serious safety issues regarding the use of makeshift box trailers at these shows. Specifically, some of the amusement operators are housing their workers, on site, in retrofitted box trailers. These box trailers are typically hidden within the perimeter of the carnival's rides and games and are being used for various purposes, including makeshift cafeterias and worker housing. In many cases, the condition of these trailers presents a serious life safety hazard. The interiors of these box trailers are typically modified so that there is a narrow (2½ feet wide) hallway with several small bedrooms, partitioned by particleboard, located off the hallway. In the event of a fire or other emergency, there is inadequate ingress/egress.

Further, the location of these trailers significantly hinders the ability of the fire department to access these trailers, as there are often rides, games, and other equipment obstructing the trailers from fire department apparatus. Should a fire or other emergency develop in one of these trailers or in this area, there could be serious consequence with the potential for multiple fatalities and injuries.

Due to this situation, we are advising that any city or town issuing a permit pursuant to M.G.L. c. 140, § 181 include a condition which **prohibits** sleeping in box trailers on the grounds. If the city or town wishes to allow these trailers, such trailers should be inspected and meet minimum fire, building, and sanitary code requirements.

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STATE FIRE MARSHAL

MEMORANDUM

TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: June 1, 2011

SUBJECT: Corn Mazes

Enclosed is a brochure developed by the Department of Fire Services as an informational document. Our agency receives multiple calls each year about what regulations apply to corn mazes. There are no regulations that directly apply to corn mazes; however there are broad statutes and regulations that would allow you to deal with situations that could lead to fire. This brochure is designed to bring about discussion between the local fire chief and corn maze operators to determine the safest approach to operating a corn maze. It is realized that each corn maze is independent and may meet some or all of these recommendations.

If you have any questions, please contact the Code Compliance & Enforcement Unit at (978) 567-3375 or in western Massachusetts at (413) 587-3181.

Basic Levels of Corn Maze Supervision

Most Protection

-Rules posted and verbal instructions given. Maps supplied to everyone. At least two supervisors present during operation. Public address system available for use. Elevated viewing platform used. Emergency flags given to visitors. Only open during the day.

Medium Protection

-Rules posted but no verbal instructions given to visitors and no maps provided. One supervisor working at all times. Public address system available for use. Elevated viewing platform available but not always used. Emergency flags not used. Open day and night.

Least Protection

-No rules posted, instructions given, or maps handed out. No supervision, public address system, or elevated viewing platform. No emergency flags used. Open day and night.

Things to Remember

- How to gain access to the specific site.
- Where is the nearest map of the maze.
- Entrances, exits, quickest way through maze.
- Who to contact in case of an emergency.
- Location of first aid kits.
- Location of fire extinguishers.
- Closest source of water for fire suppression.

Corn Mazes



Recommendations brought to you by:



Massachusetts Department of Fire
Services
P.O. Box 1025, State Road
Stow, MA 01775

Corn Mazes can be a fun and enriching experience for children of all ages and their families. When owning or operating a corn maze it is your job to provide the fun experience that everyone is expecting. You need to make sure that you can provide a safe experience that will make everyone want to come back in future weeks, or years and to tell all of their friends to come too. There are many things that can come in the way of that experience though. The main problem, which could happen at a corn maze, would be to have a medical or fire emergency and to not be prepared for it. There are many preventative and precautionary measures which can be taken to ensure that if an emergency did happen, your staff would be well prepared to handle it in a professional manner. Below are some simple steps that can be taken to further prepare your establishment for either a medical or fire emergency.

-Advise employees on the fire/life safety guidelines prior to assuming their duties.

-Consider CPR training for employees.

-Practice evacuation methods with employees so they are prepared in the case of an actual emergency.

-Provide visitors with safety instructions prior to their entrance into the maze.

-Provide the opportunity to the Fire Department to walk through and “preplan” in case the of an actual emergency.

-Absolutely no smoking on the premises.

-No open flame devices or equipment within the maze.

-Provide flashlights if operating during hours of darkness. No gas fired lanterns, candles, etc.

-Work related tasks involving gas or possible sparks done when visitors aren’t in maze.

-No more than 200 people per acre in the maze.

-Motorized vehicles should stay at a distance from the maze.

-Service road around the outside of the maze so emergency vehicles are capable of reaching any point of the maze as quickly as possible.

-Elevated viewing platform above the level of the maze to look for potential risks.

-Public address system available to assist in making announcements to visitors (e.g. bull horn or loud speaker).

-Never block entrance or exit when visitors are in the maze.

-Provide a map of the maze for visitors to use for quick exit if necessary.

-Give guests the ability to alert employees in case of emergency (e.g. easily recognizable flag to carry in the maze).

-Create a firebreak between the maze and surrounding land to prevent a surrounding fire from spreading into the maze.

-Have fire extinguishers readily available for emergency use.

-Make employees easily recognizable so visitors know whom to come to in the case of an emergency.

In the case of an emergency: **Call 911**





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STEPHEN D. COAN
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MEMORANDUM

TO: Heads of Fire Departments

FROM: Stephen D. Coan
State Fire Marshal

DATE: June 1, 2011

SUBJECT: MA Fire Department Response to EMS Calls & MVA's

On July 1, 2009, the Department of Fire Services was awarded a federal Section 408 grant to fund part of a Federal Fiscal Year 2008 application. The Massachusetts Traffic Records Coordinating Committee (TRCC) awarded \$40,284 in part to fund geographic information system (GIS) analysis of reported fire department responses to motor vehicle accidents (MVA's) and calls for emergency medical services (EMS).

The majority of local fire departments in the Commonwealth submit all of their run reports to the Massachusetts Fire Incident Reporting System (MFIRS). As part of the grant process DFS agreed to provide the TRCC with three studies. The first report is an analysis of local fire department response to EMS-type calls that have been reported to MFIRS from 2001 through 2009. The second report is an analysis of fire department response to motor vehicle fires caused by collisions that have been reported to MFIRS from 2001 through 2009. The last report is an analysis of fire department response to motor vehicle accidents (MVA's) that have been reported to MFIRS from 2001 through 2009.

As would be expected the larger communities or communities with major highways reported the most of these types of incidents. Boston, Framingham, Revere, Worcester and Malden reported the most EMS calls to MFIRS from 2001 through 2009. Boston, Worcester, Medford, Lawrence, and Weymouth reported responding to the most MVA's during the same time period. Boston, Springfield, Worcester, Milton, and Swansea reported responding to the most motor vehicle fires caused by collisions.

I hope you'll be able to use these reports to better demonstrate the services that your departments provide to your communities. If you have any questions, call Derryl Dion at 978-567-3382 or e-mail at Derryl.dion@state.ma.us.

Administrative Services • Division of Fire Safety
Hazardous Materials Response • Massachusetts Firefighting Academy

Fire Department Response to Emergency Medical Service Type Calls in Massachusetts 2001 – 2009



MFIRS
Massachusetts Fire Incident Reporting System

Fire Service Assists with EMS & Crash Data Analysis

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The majority of local fire departments in the Commonwealth provide EMS in their jurisdictions. These services may be as first responders, at the basic life support level or the advanced life support level. Many of these local departments submit all of their run reports to the Massachusetts Fire Incident Reporting System (MFIRS). This report is one of three studies that was agreed upon as part of the grant process. This report is an analysis of local fire department response to EMS-type calls that have been reported to MFIRS from 2001 through 2009.

Mandatory Reporting by MA Fire Departments

Under Massachusetts General Law Chapter 148 Section 2, local fire departments are only mandated to report fires or explosions that result in a dollar loss or human casualty and Section 2A, any fire that occurs at a school that has any grades between Kindergarten and grade 12. Fire departments submit these incidents either electronically or on paper to the MFIRS.

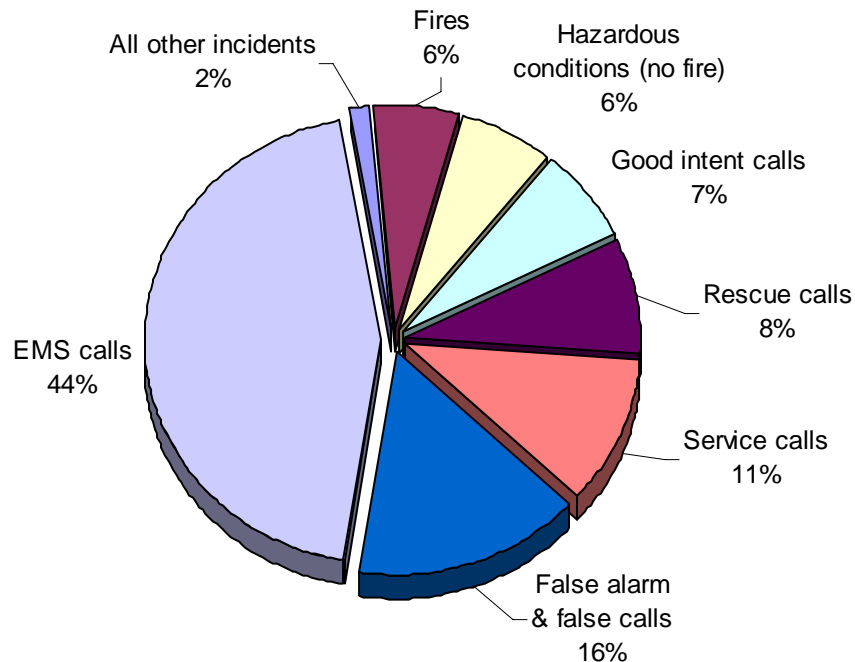
Fire Departments Do More Than Just Fight Fires

Massachusetts fire departments do much more than just fight fires. Over the past couple of decades they have branched out and taken on the added responsibilities for EMS responses, multiple types of specialized rescues, hazardous materials incidents, responding during and after natural disasters, as well as the typical service calls, good intent calls, false alarms and the special types of incidents that do not fit neatly into any of the other categories. These numbers have risen as more fire departments automate their reporting and have voluntarily reported all of their incidents MFIRS, not just those that they are mandated to report.

EMS Calls are 44% of All FD Responses

Emergency Medical Service (EMS) incidents represent the majority of reported incidents in MFIRS. From 2001 through 2009 there were 2,199,756 reported EMS calls to MFIRS. These 2,199,756 calls made up 44% of all the calls in MFIRS. This is over 2.5 times more than the second leading incident type of False Alarm and False Calls, which makes up 16% of total calls.

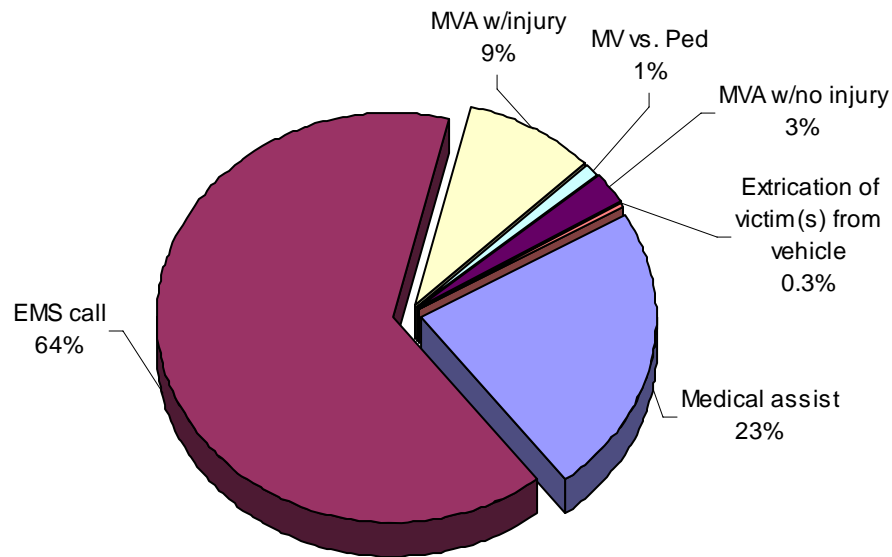
Fire Department Calls by Incident Type 2001 - 2009



EMS Calls are Almost 2/3 of All EMS Type Incidents

EMS calls (Incident Type – 321) are when a fire department ambulance responds to a call for a medical emergency, transport or refusal of treatment. From 2001 to 2009, 1,420,628 were voluntarily reported to MFIRS. These types of calls make up 64% of all the types of EMS calls and 29% of all calls of any type. There were 498,847 reported medical assists. Medical assists (Incident Type – 311) are when a fire department provides medical assistance to another group or agency that has the primary EMS responsibility in their jurisdiction. These calls make up 23% of all reported EMS calls and 10% of all calls. There were 196,976 reported motor vehicle accidents (MVAs) with reported injuries (Incident Type – 322). These calls represent 9% of all reported EMS type calls and 4% of all fire department incidents. Motor vehicle accidents with no injury (Incident Type – 324) accounted for 55,824 incidents, or 3% of all EMS type calls and 1% of all reported calls. There were 21,281 motor vehicle accidents involving pedestrians (Incident Type – 323). These calls accounted for 1% of all EMS type calls and less than 1% of all calls. Fire departments reported responding to 6,200 extrication of victims from a vehicle (Incident Type – 352). These calls were the cause of less than 1% of both EMS type calls and all types of calls.

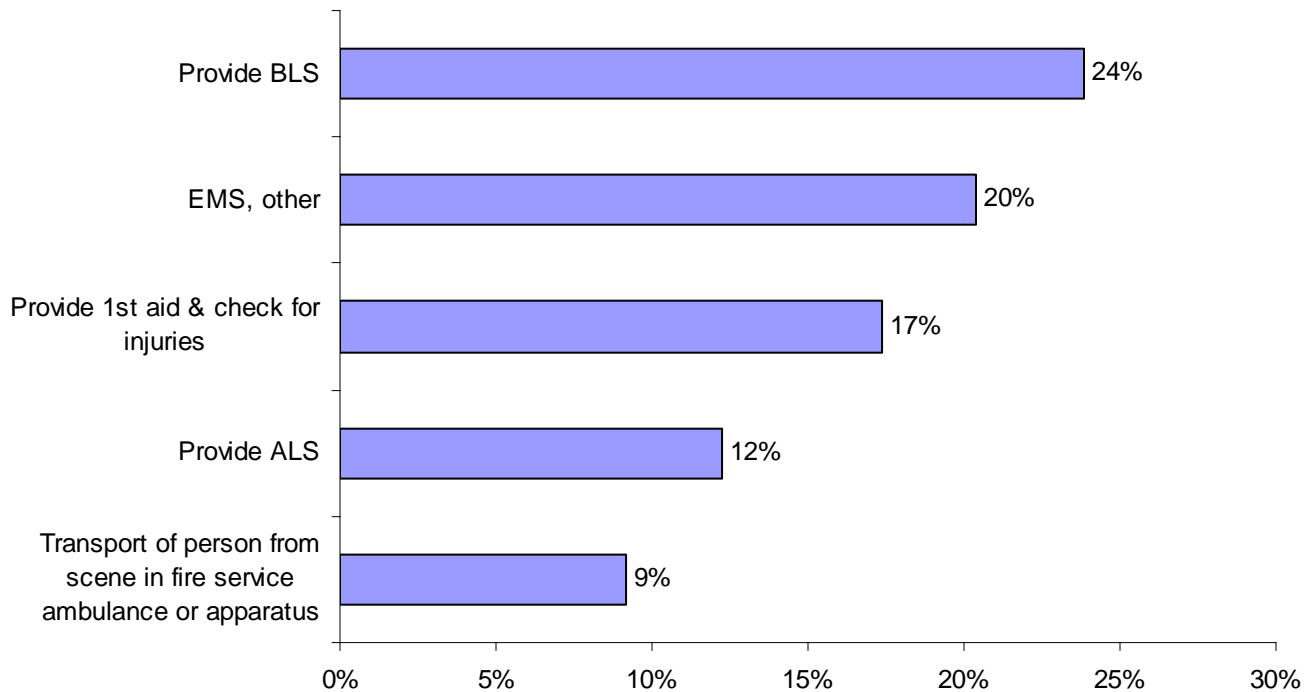
EMS Calls by Type 2001 - 2009



Providing Basic Life Support is Almost 1/4 of Actions Taken

Of all the reported EMS type calls 524,349, or 24%, reported that providing basic life support (BLS) was the principle action taken while on the call. Unclassified EMS activities (EMS, other) was the second leading action taken reported at 20%. Seventeen percent (17%) of the calls reported providing first aid and check for injuries as their primary action taken. Providing advanced life support (ALS) was the primary action taken for 12% of these calls. Transport of a person from the scene in a fire service ambulance or apparatus was reported as the primary action taken in 9% of all EMS type calls.

Leading Actions Taken During EMS Calls 2001 - 2009

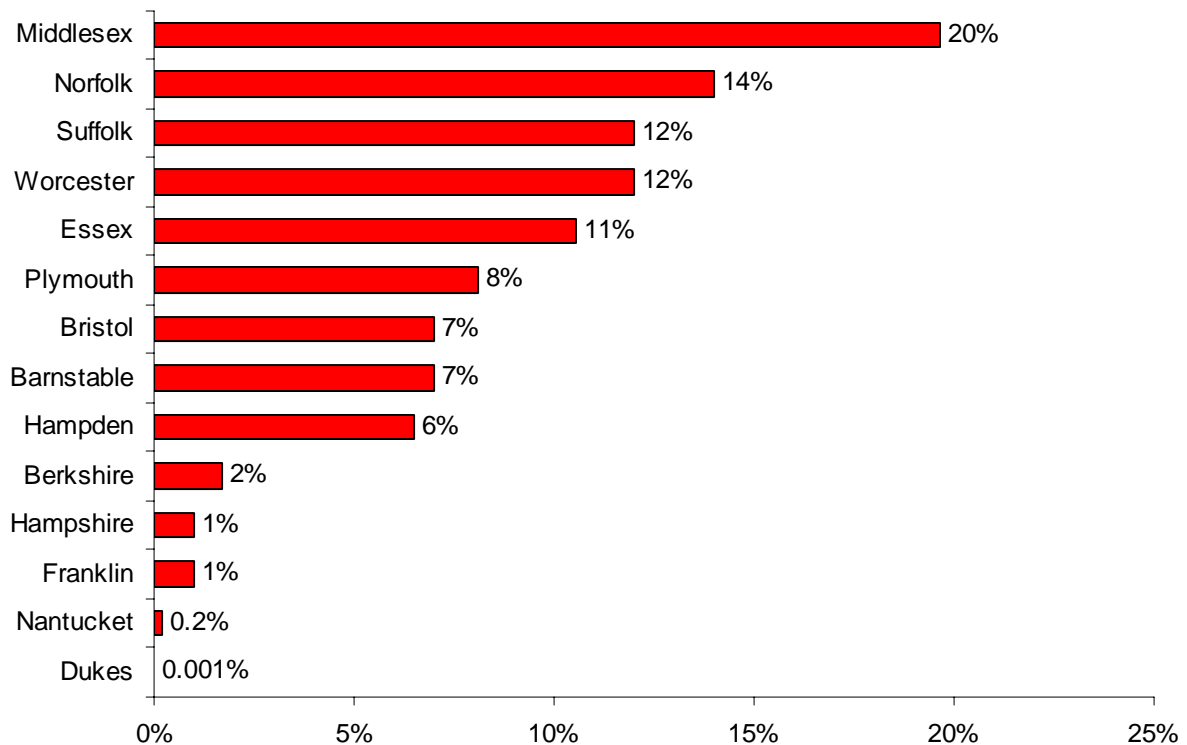


Middlesex County Reported the Most EMS Type Calls

From 2001 – 2009, fire departments in Middlesex County voluntarily reported the most EMS type calls in Massachusetts. Local fire departments in Middlesex County reported 432,079 calls, or 20%, of all EMS types in MFIRS. Norfolk County fire departments reported 14% and Suffolk and Worcester Counties fire departments each reported 12% of these calls. Essex County reported 11%; Plymouth County reported 8%; Bristol and Barnstable Counties each reported 7%; and Hampden County reported 6% of all EMS calls. Berkshire County reported 2%; Hampshire and Franklin Counties each reported 1%; and Nantucket and Dukes County each reported less than 1% of all EMS type calls in the Commonwealth.

The map on page 16 shows the five-year average (2005 - 2009) of EMS runs reported to MFIRS by county. Middlesex County had the highest average with 62,271 EMS runs reported per year. Norfolk County had the second highest average with 39,904 runs reported annually. Suffolk, Essex and Worcester Counties rounded out the top five counties that reported the most EMS runs to MFIRS from 2005 through 2009.

EMS Calls by County 2001 - 2009



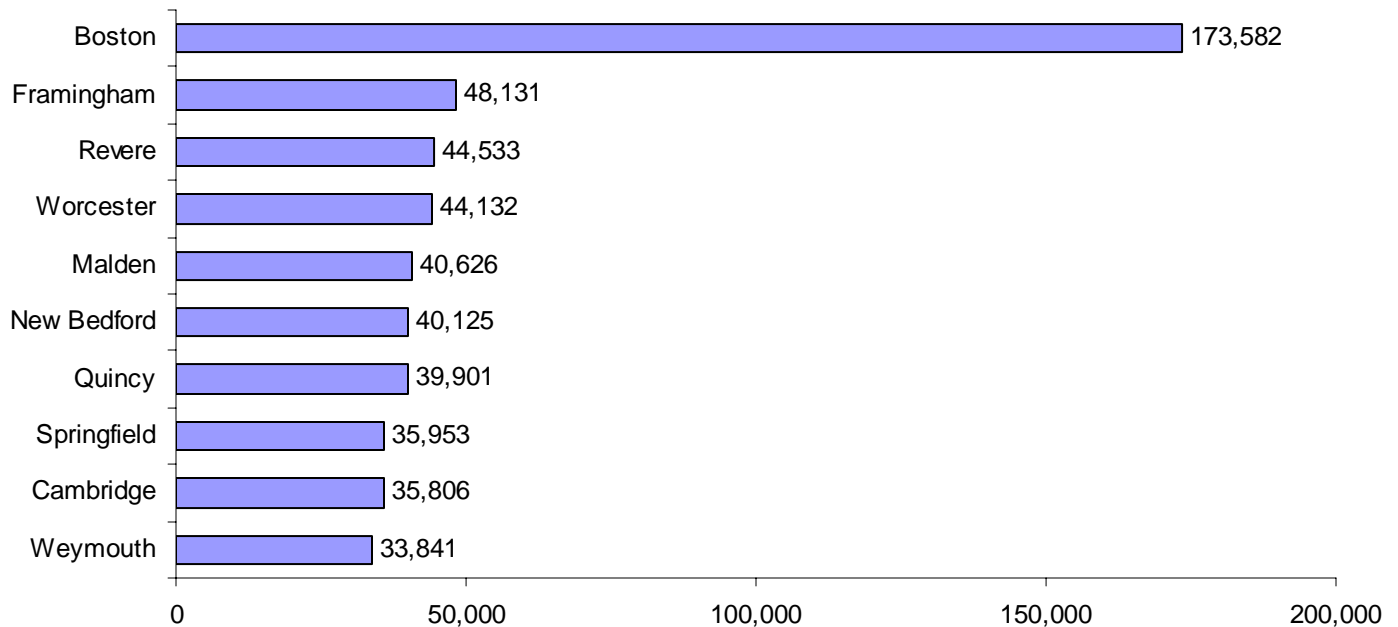
Boston Reported Most EMS Type Calls of Any Local Fire Department

From 2001 – 2009, the Boston Fire Department voluntarily reported 173,582¹ EMS type calls. This represents 8% of all EMS calls statewide and over 3.5 times more than the second leading department, Framingham. Framingham reported 48,131; Revere reported 44,533; Worcester reported 44,132 and Malden reported 40,626 EMS calls of all types. New Bedford (40,125), Quincy (39,901), Springfield (35,953), Cambridge (35,806), and Weymouth (33,841) round out the top 10 fire departments reporting these calls in Massachusetts.

The map on page 17 shows the five-year average (2005 - 2009) of EMS runs reported to MFIRS by city or town. Boston had the highest average with 27,818 EMS runs reported per year. New Bedford had the second highest average with 6,207 runs reported annually. Framingham, Revere and Malden round out the top five communities that reported the most EMS runs to MFIRS from 2005 through 2009.

¹ Boston didn't report these types of calls in 2001 or 2002; they started reporting all of their calls in 2003. Using the average for the seven years that they did report EMS type calls of 24,797 per year to complete 2001 & 2002, Boston would have 223,176 EMS type calls, reporting over 4.5 times more than Framingham.

Leading Fire Departments Reporting EMS Incidents 2001 - 2009



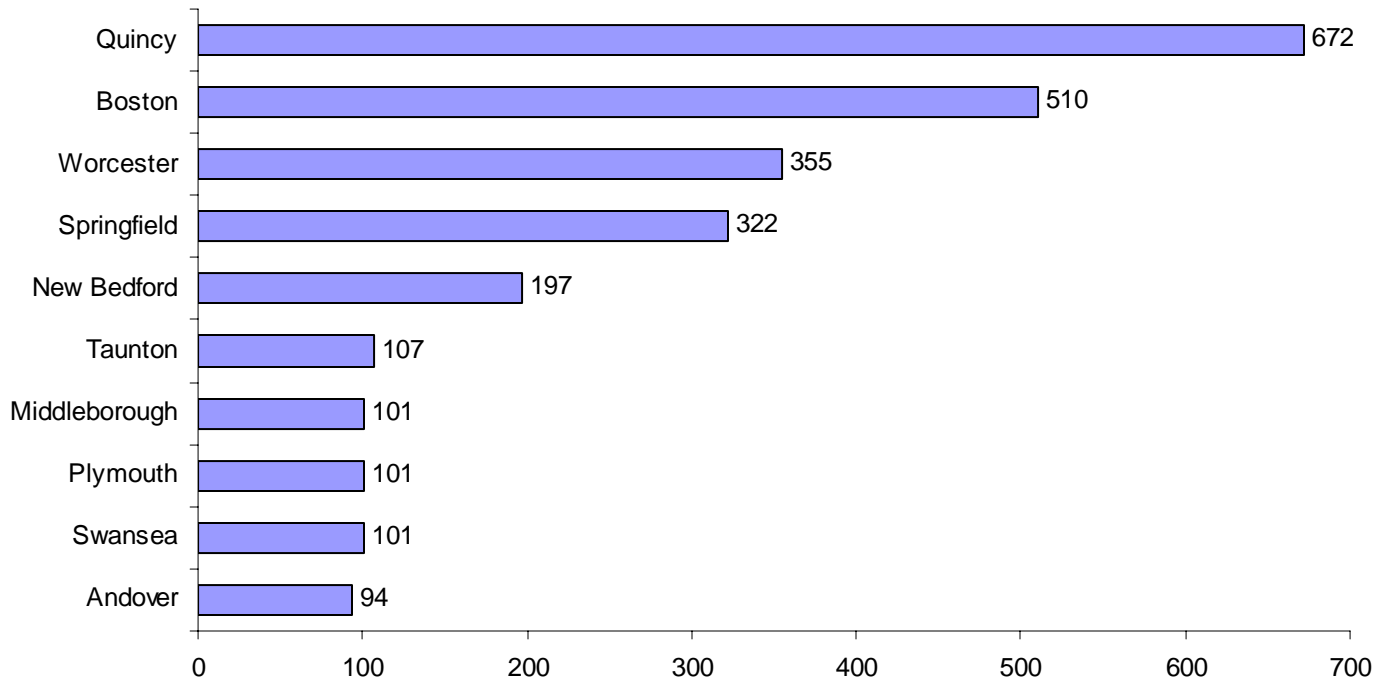
Quincy Reported the Most Vehicle Extrications

Massachusetts fire departments voluntarily reported 6,200 extrications of persons from vehicles to MFIRS from 2001 through 2009. The Quincy Fire Department reported the most auto extrications of victims. They reported 672 extrications, or 11% of the total number reported. Boston was the second leading reporter with 510 extrications.

Worcester reported the third most with 355; Springfield reported 322; and New Bedford reported 197. Taunton reported 107 extrications; Middleborough, Plymouth and Swansea each reported 101 extrications; and Andover reported 94 vehicle extrications rounding out the top 10 departments in the state.

Most if not all of the communities that reported the most vehicle extrications have at least one interstate, U.S. or MA route or major roads going through them. Some have multiple highways traversing their boundaries.

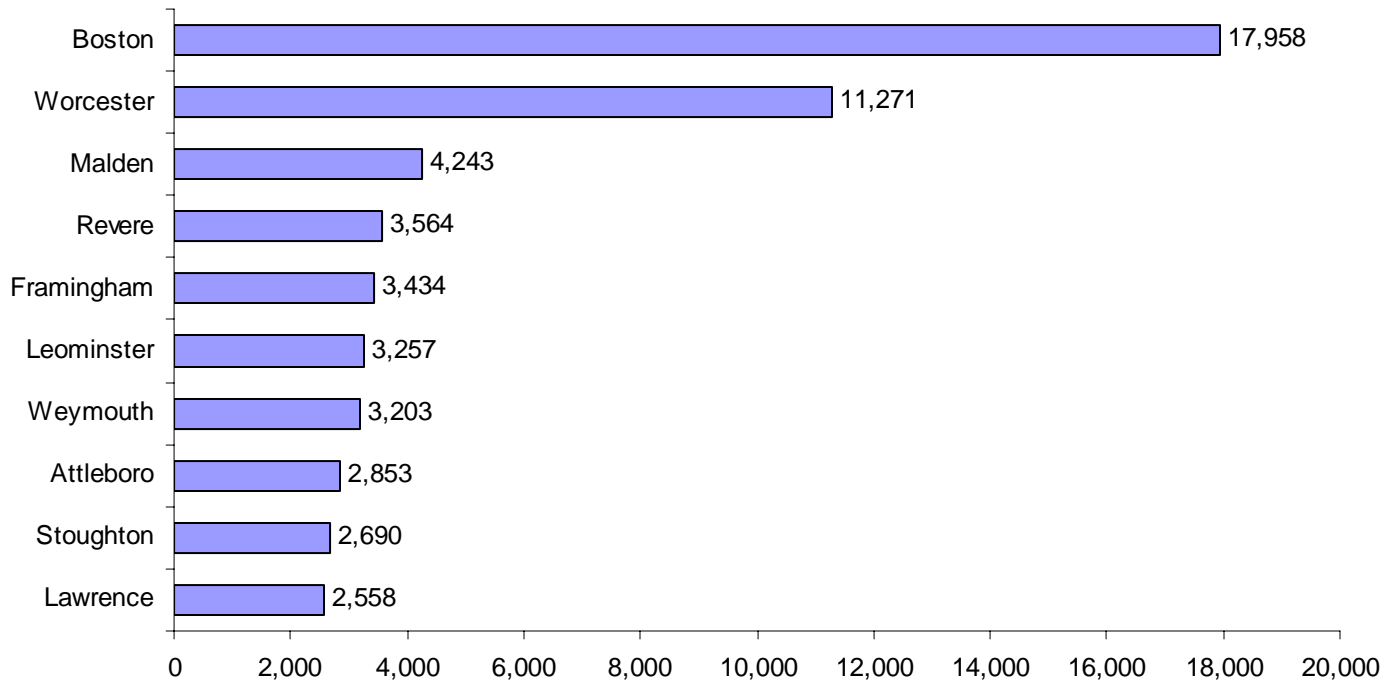
Auto Extrication of Victims 2001 - 2009



Boston Reported the Most Vehicle Accidents with Injuries

From 2001 through 2009 local Massachusetts fire departments reported that they responded to 196,976 motor vehicle accidents with injuries. Boston, reported the most of these calls with 17,958 even though they did not report these types of calls in 2001 and 2002. These 17,958 Boston calls represent 9% of the total 196,976 motor vehicle accidents with injuries. Worcester with 11,721 of these calls reported the second most accidents with injuries. Malden was third with 4,243; Revere was fourth with 3,564; and Framingham reported the fifth most accidents with injuries, 3,434. Leominster (3,257), Weymouth (3,203), Attleboro (2,853), Stoughton (2,690), and Lawrence (2,558) round out the top 10 or responding to motor vehicle accidents with injuries.

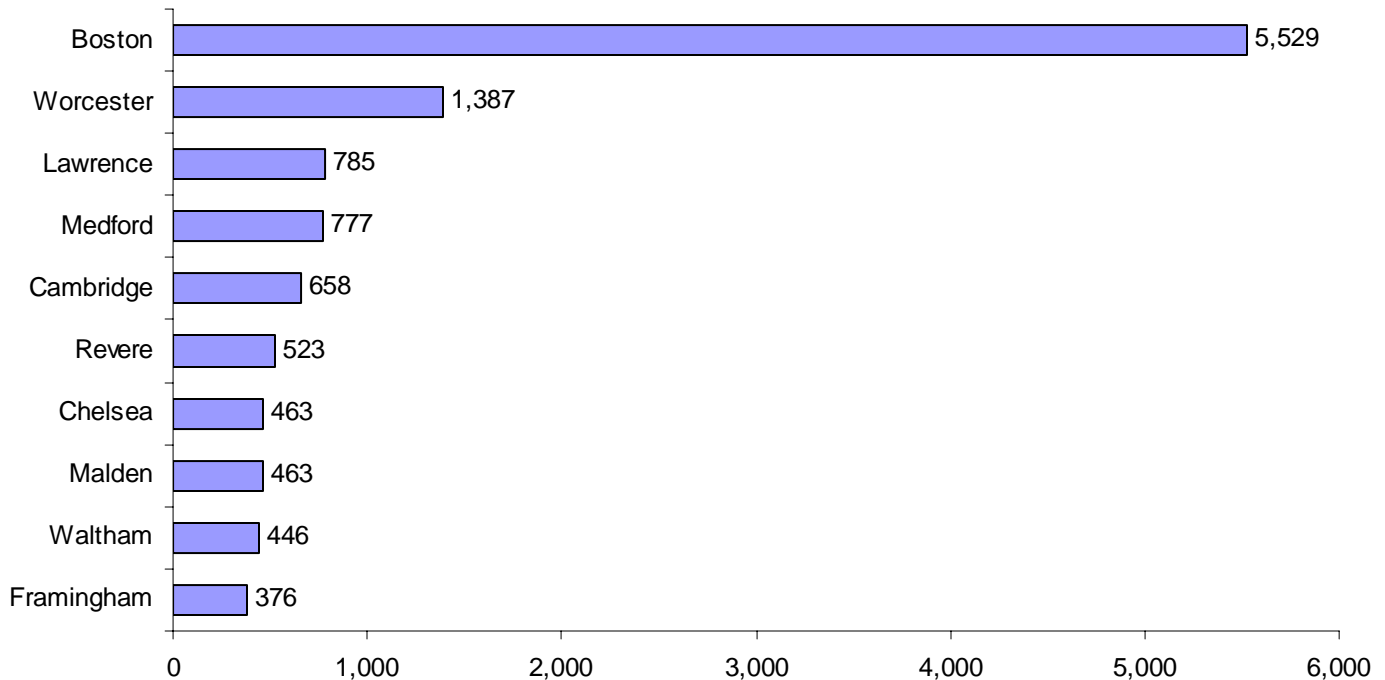
Motor Vehicle Accident with Injury 2001 - 2009



Boston had Over 1/4 of Motor Vehicle vs. Pedestrian Accidents

From 2001 to 2009 Massachusetts fire departments voluntarily reported that they responded 21,281 incidents involving a motor vehicle striking a pedestrian (MV vs. pedestrian). Boston reported the most of these types of accidents with 5,529, or 26%. This was four times more than the department with the second most motor vehicle vs. pedestrian incidents. Worcester reported the second most with 1,387. Lawrence reported 785 of these incidents ranking it third behind Boston and Worcester. Medford reported 777 and Cambridge went to 658 of these calls. Revere (523), Chelsea (463), Malden (463), Waltham (446), and Framingham (376) round out the top 10 for reported motor vehicle vs. pedestrian accidents in Massachusetts.

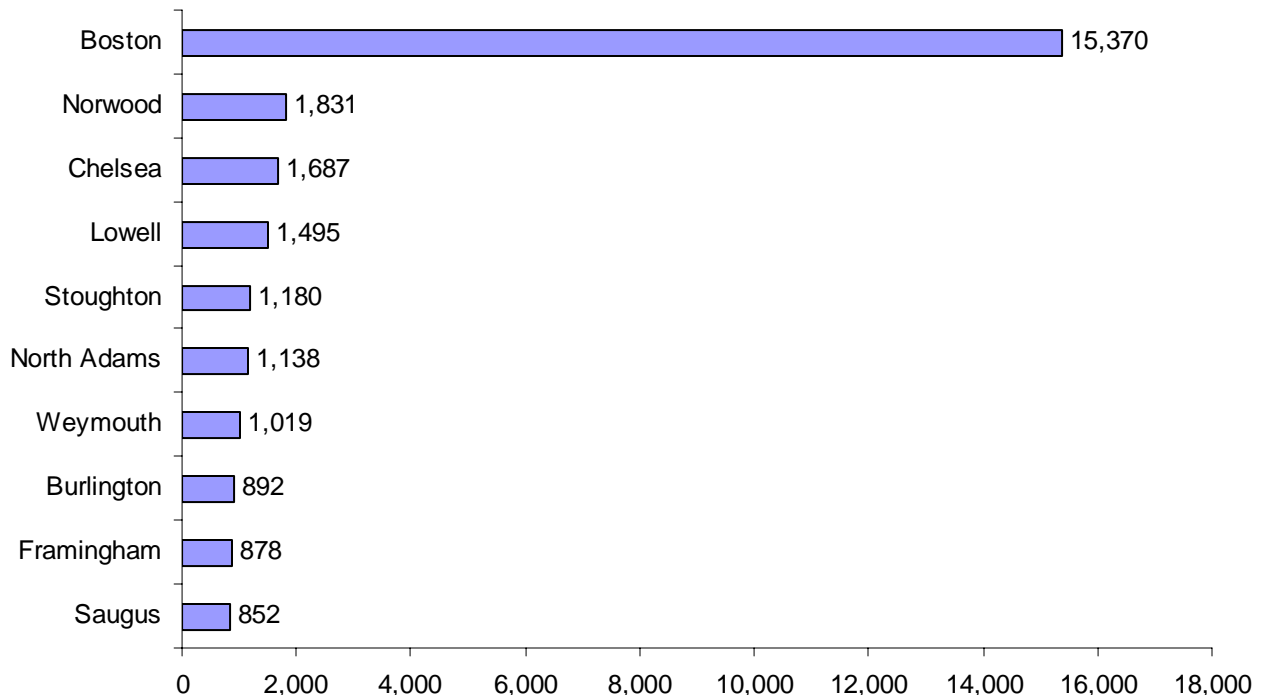
Motor Vehicle vs. Pedestrian Accidents 2001 - 2009



Boston had Over 1/4 of Motor Vehicle vs. Pedestrian Accidents

From 2001 to 2009 Massachusetts fire departments voluntarily reported that they responded 55,824 incidents involving a motor vehicle accidents without an injury (MVA w/out injury). Boston reported the most of these types of accidents with 15,370, or 28%. This was 8.4 times more than the department with the second most motor vehicle accidents without an injury. Norwood reported the second most with 1,831. Chelsea reported 1,687 of these incidents ranking it third behind Boston and Norwood. Lowell reported 1,495 and Stoughton reported going to 1,180 of these calls. North Adams (1,138), Weymouth (1,019), Burlington (892), Framingham (878), and Saugus (852) round out the top 10 for reported motor vehicle accidents without an injury in Massachusetts.

Motor Vehicle Accident without Injury 2001 - 2009



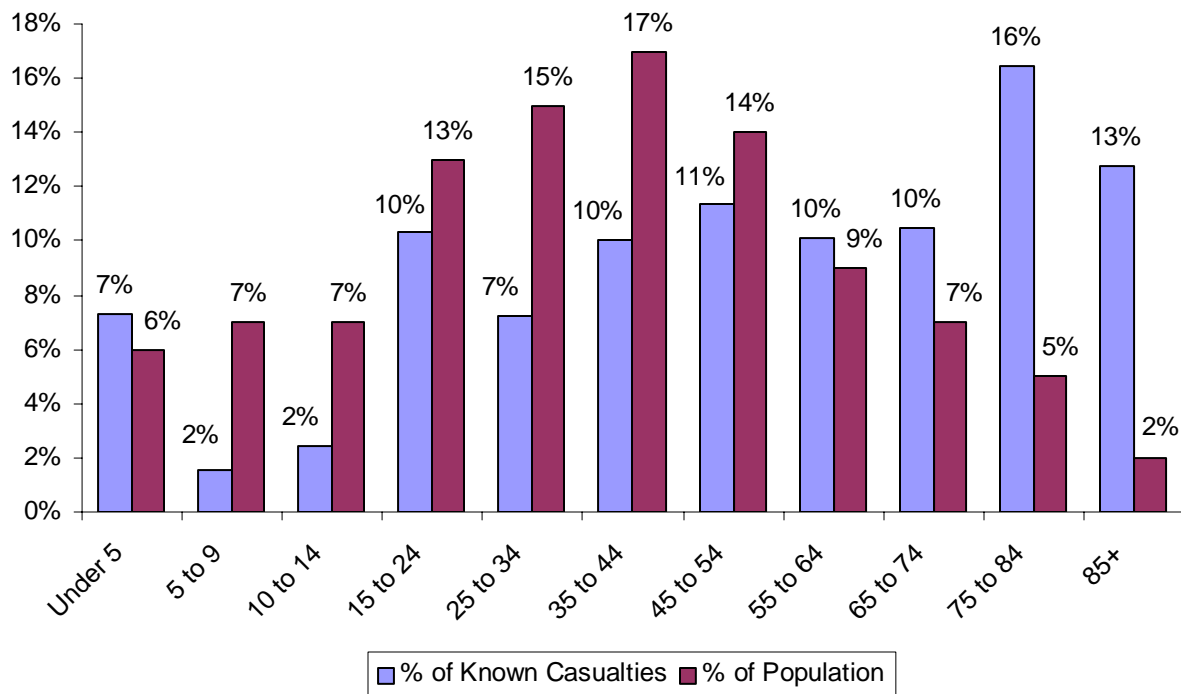
Over 1/2 of Patients Were Female

Over half 56,126, or 54%, of the 103,716 patients that were reported on EMS Modules where gender was known were women. Forty seven thousand five hundred and ninety (47,590), or 46% were men.

Older Adults & Young Children at Greater Risk for Injuries or Illness

Older adults, especially those over the age of 85 had the greatest risk of being transported for an injury or illness. Older adults over the age of 85, account for 2% of the population but 13% of these patients. The risk of an injury or illness for these adults is 6.4. This means that these adults were over six times as likely to need to be transported to a hospital. The following graph shows the percentage of age of patients versus population percentage by age groups for the time period from 2001 to 2009. Other older adults, between the ages of 75 and 84, accounted for 5% of the population but 16% of the fire deaths. Their risk of needing transport was at 3.3. Older adults in the age range of 65 to 74 also had a higher risk of needing transport at 1.5; and adults between the ages of 55 and 64 had a slightly elevated risk at 1.1. Children under five also had a slightly higher risk of needing to be transported to a hospital at 1.2.

Age of Known EMS Casualties



How to Read the Preceding Chart

If an age group represents 10% of the population, we expect it to account for 10% of the casualties. If it accounts for a higher percentage of casualties than it does for the overall population, that group is at a higher risk of becoming a casualty. If the age group accounts for a lower percentage of casualties than it does for the overall population, then that group is at a lower risk of becoming a casualty.

The percentages of the population in each age group were calculated using data from the 2000 Census from the U.S. Census Bureau.

EMT-Basic Was the Greatest Initial Level of Care

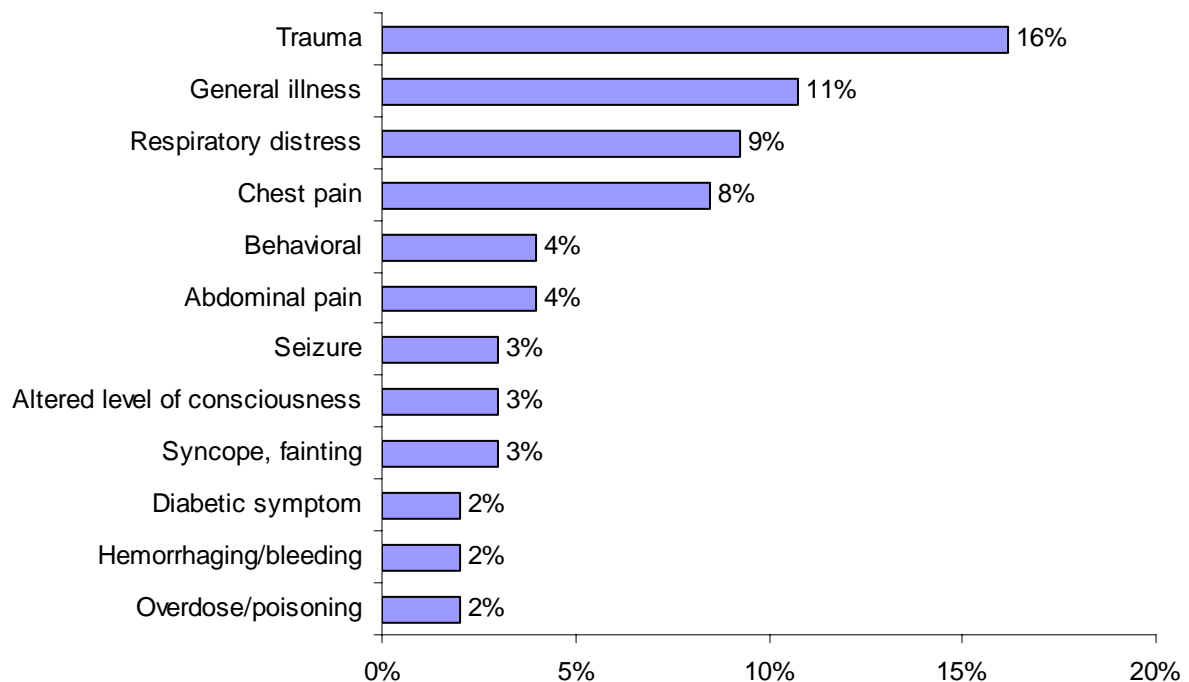
Over half, 53%, of the 124,474 patients where Initial Level of Care was reported were first aided by basic level emergency medical technicians (EMT-B). Twenty-four percent (24%) were first cared for by paramedics (EMT-P), and 18% were first aided by first responders. Intermediate level emergency medical technicians (EMT-I) accounted for only 2% of initial patient care, and 3% were reported as 'Other' or not reported.

Paramedic Was the Highest Level of Care for Over 2/3 of All Patients

Sixty-nine percent (69%), over two-thirds were cared for by at least one paramedic. Fifteen percent (15%) had basic EMT's for their highest level of pre-hospital care; and 2% were cared for by intermediate EMT's. Fourteen percent (14%) were reported as 'Other' or not reported.

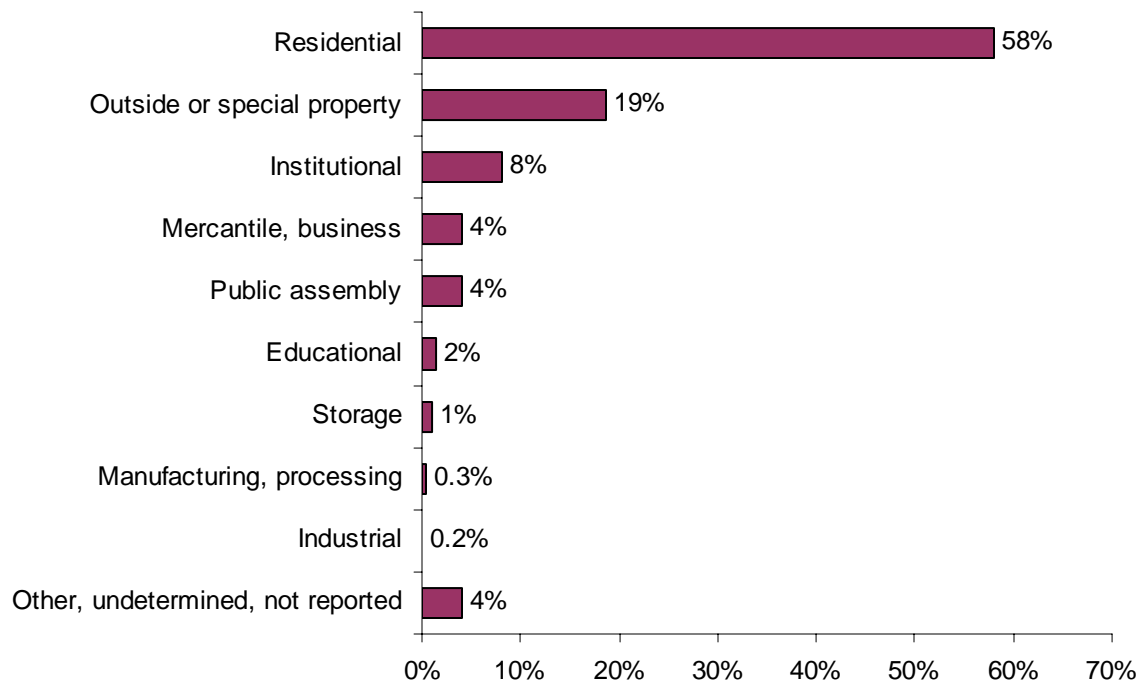
Trauma was the Leading Cause of Response

Of the 124,474 EMS Modules that were completed, the leading coded value for Provider Assessment was trauma, accounting for 16% of the patients. General illness was the second leading assessment at 11%. Respiratory distress at 9% and chest pains at 8% followed. Four percent (4%) of the assessments were each caused by behavioral problems and abdominal pain. Seizures, altered level of consciousness and syncope or fainting were each an assessment for 3% of these patients. Diabetic symptoms, hemorrhaging or bleeding and overdose or poisoning were each responsible for 2% of provider assessments.

Leading Causes of Provider Assessment**Over 1/2 of All EMS Type Calls Occur in the Home**

Of the 2,199,756 EMS type calls, 1,277,066, or 58%, occurred on or in a residential property. Outside or special properties were the second leading property use for these types of calls accounting for 19%. Mercantile or business properties and public assembly properties each accounted for 4%; 2% occurred at educational facilities and 1% happened at storage facilities. Manufacturing facilities and industrial facilities each had less than 1% occur there. There were 90,354 other, undetermined or not reported property uses, accounting for 4% of all the reported fire department responses to EMS type calls in Massachusetts from 2001 through 2009.

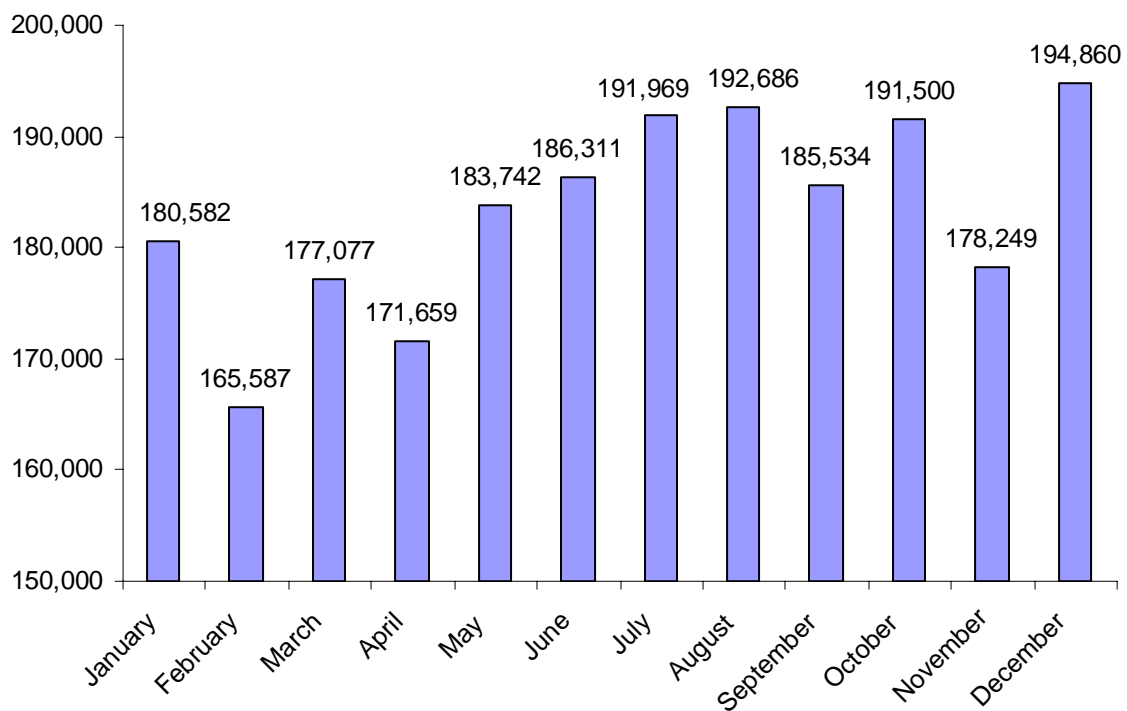
EMS Calls by Property Use 2001 - 2009



EMS Type Calls Most Common in December & Summer Months

December was the peak month for these incidents. August ranked second and July had the third largest number of EMT Type Calls. The late Winter and early Spring months

EMS Type Calls by Month 2001 - 2009

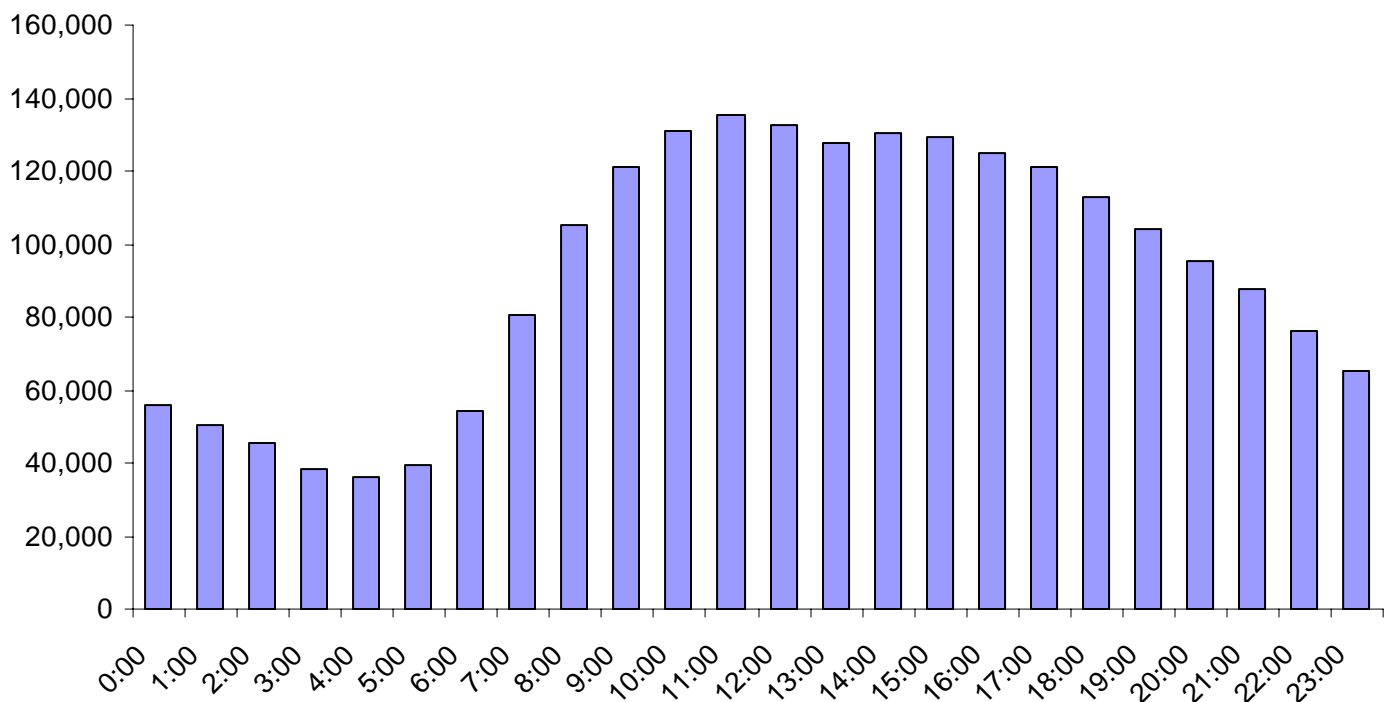


had significantly fewer calls of these types. The fewest EMS calls occurred in February. April had the second lowest frequency of these incidents, and March had the third lowest number of EMS type calls from 2001 - 2009.

EMS Type Call Most Common Around Lunch Time

EMS type calls occurred most often around lunchtime. They reached their lowest point between 12:00 a.m. and 6:00 a.m. and increased fairly steadily to a peak between 11:00 a.m. and 12:00 p.m. Thirty-six percent (36%) of all of these calls occurred during one-quarter of the day, between the hours of 10:00 a.m. and 3:00 p.m.

EMS Type Calls by Hour 2001 - 2009

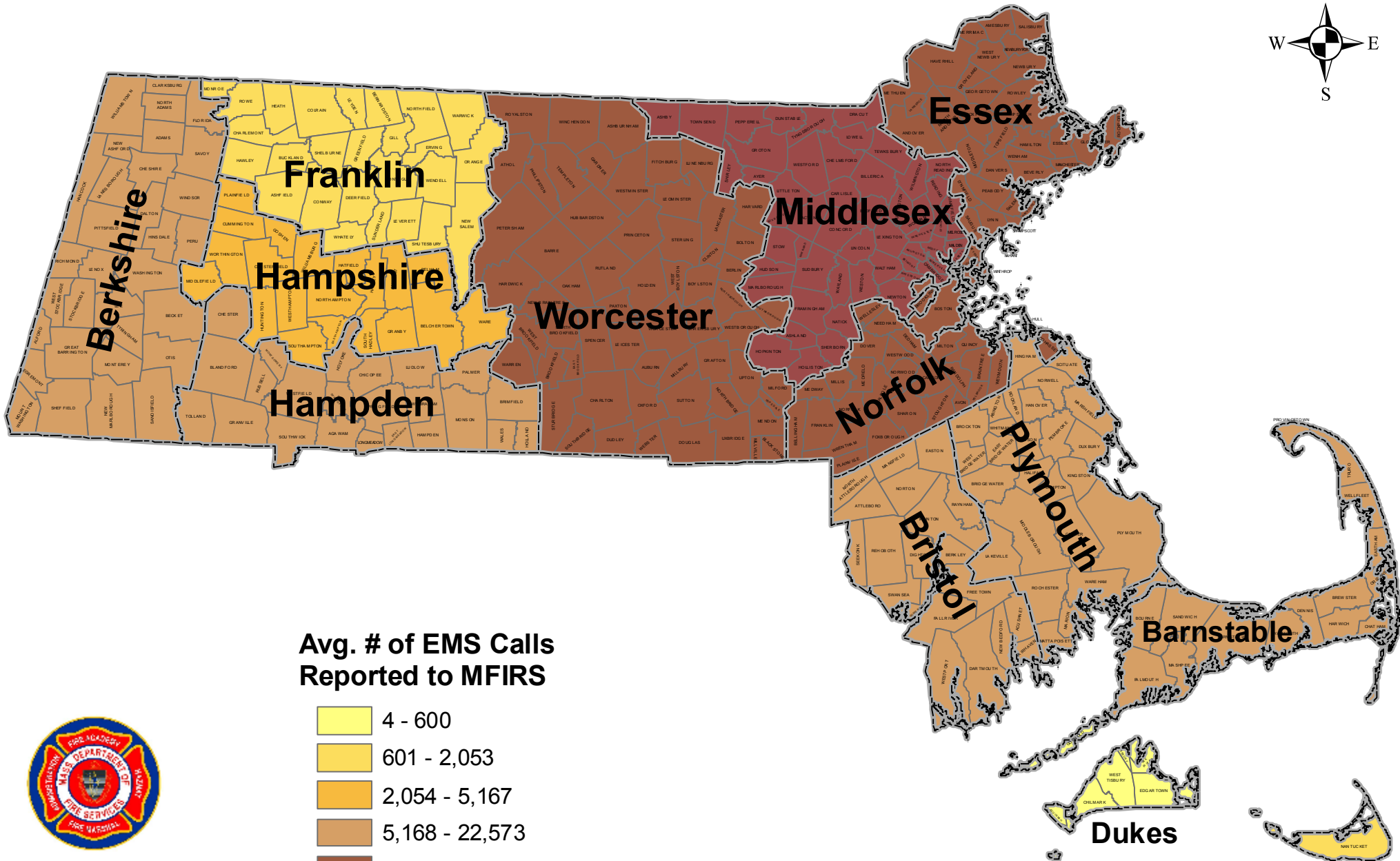


The previous graph shows fire frequency by time of day on the 24-hour clock for EMS calls. Midnight to 1:00 a.m. is represented by 0:00, 1:00 a.m. to 2:00 a.m. is represented by 1:00, etc.

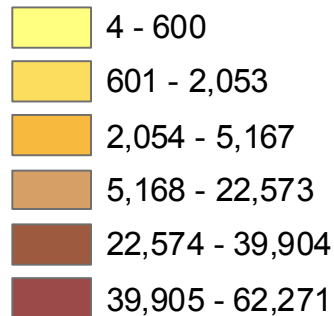
EMS Incidents = Most Fire Department Calls

EMS type incidents make up the majority of calls reported to MFIRS from 2001 through 2009. Forty-four percent (44%) of all reported incidents were calls for emergency medical services, including motor vehicle accidents. During these calls providing basic life support to the patient was leading action taken. The leading age group of patients were people between the ages of 75 and 84. Trauma was the leading assessment made by fire department EMS providers; general illness was the second leading assessment. Paramedics were by far the highest level of pre-hospital care reported. Most of these types of calls come in July, August and September; and occur during lunchtime.

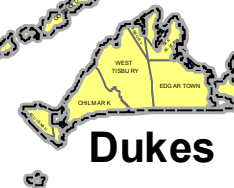
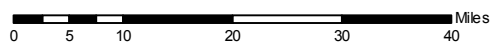
Average Number of EMS Calls Reported to MFIRS by County 2005 - 2009



**Avg. # of EMS Calls
Reported to MFIRS**



MFIRS
Massachusetts Fire Incident Reporting System

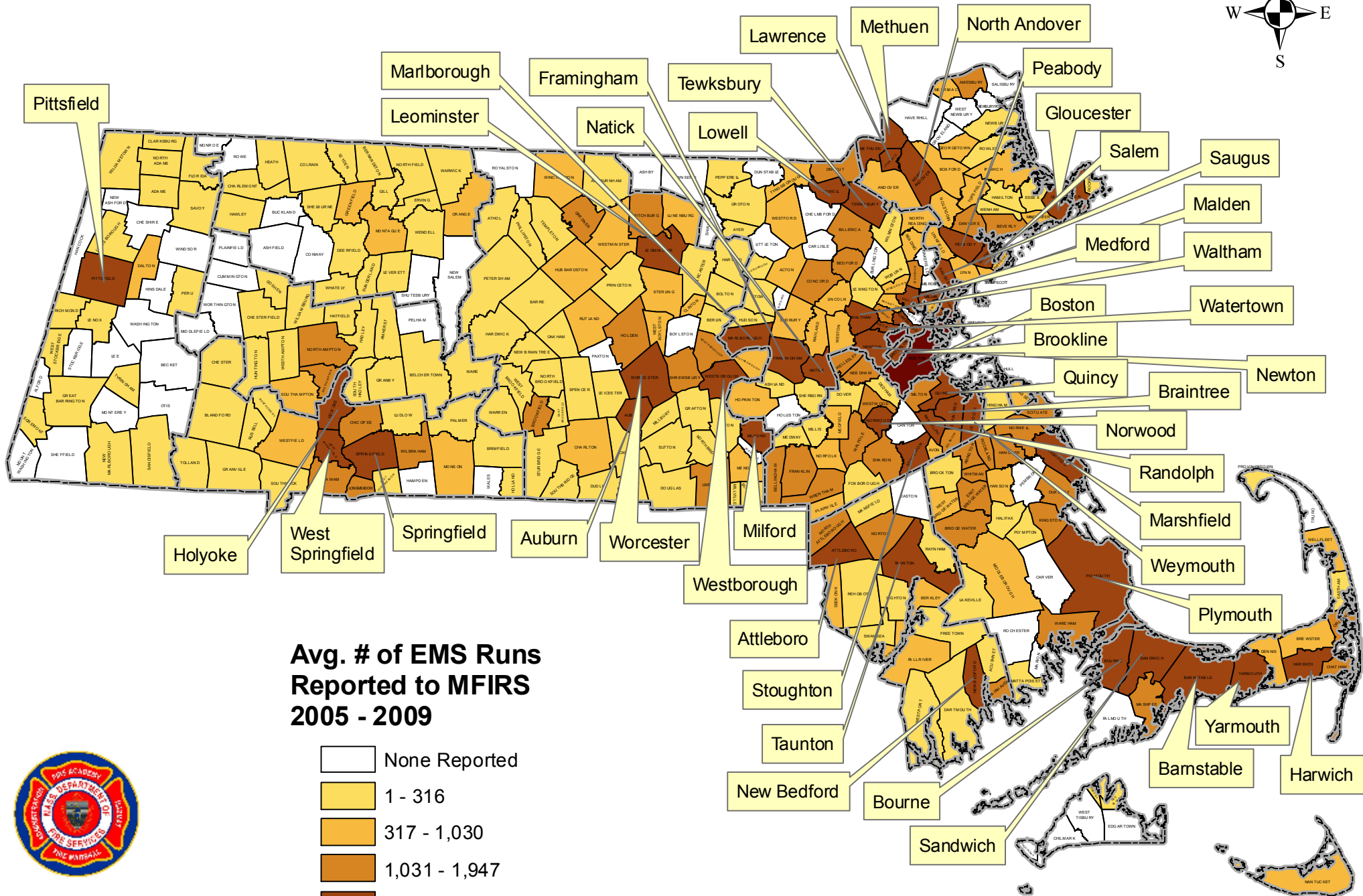


Dukes

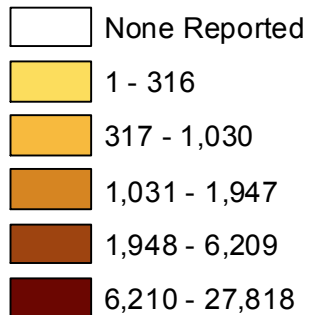


Nantucket

Average Number of EMS Runs Reported to MFIRS 2005 - 2009



**Avg. # of EMS Runs
Reported to MFIRS
2005 - 2009**



MFIRS
Massachusetts Fire Incident Reporting System

0 5 10 20 30 40 Miles

Motor Vehicle Fires Caused by Collisions in Massachusetts 2001 – 2009



MFIRS
Massachusetts Fire Incident Reporting System

Fire Service Assists with EMS & Crash Data Analysis

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No one in recent memory has looked at motor vehicle fires caused by collisions. Since the majority of these occur on public roads it may be of interest to the TRCC. Local fire departments respond to these fires in their jurisdiction and submit these reports to the Massachusetts Fire Incident Reporting System (MFIRS). This report is one of three studies that was agreed upon as part of the grant process.

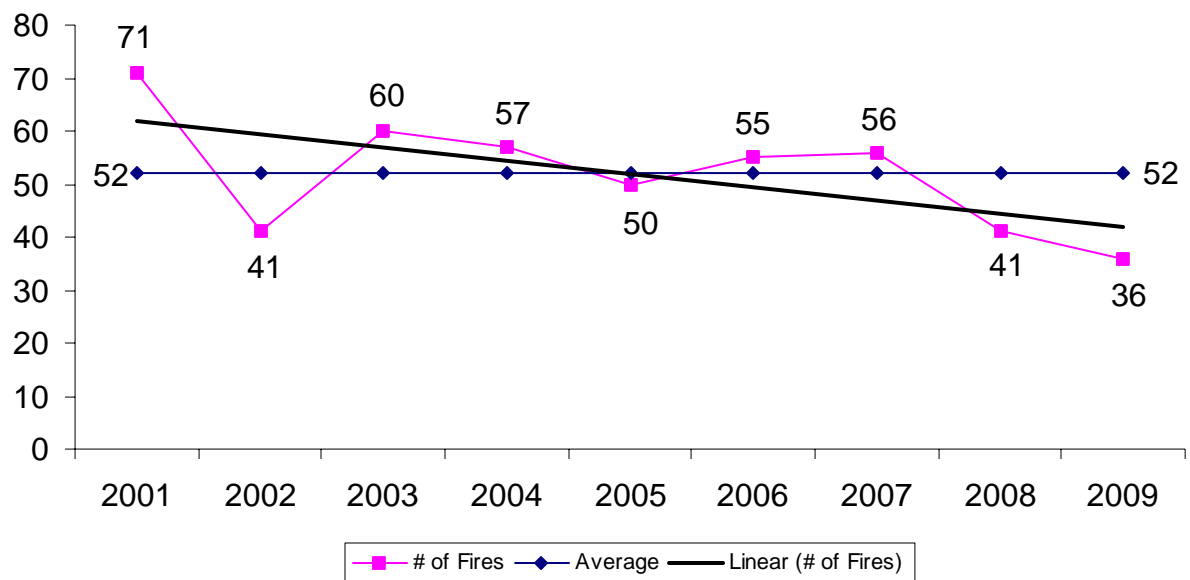
Mandatory Reporting by MA Fire Departments

Under Massachusetts General Law Chapter 148 Section 2, local fire departments are only mandated to report fires or explosions that result in a dollar loss or human casualty and Section 2A, any fire that occurs at a school that has any grades between kindergarten and grade 12. Fire departments submit these incidents either electronically or on paper to the MFIRS.

Averaged 1 MV Fire from Collision Per Week from 2001 – 2009

There were a reported 467 motor vehicle fires caused by collision in the Commonwealth from 2001 through 2009. This averages out to 52 of these fires per year, or one per week during that time period.

MV Fires from Collisions 2001 - 2009

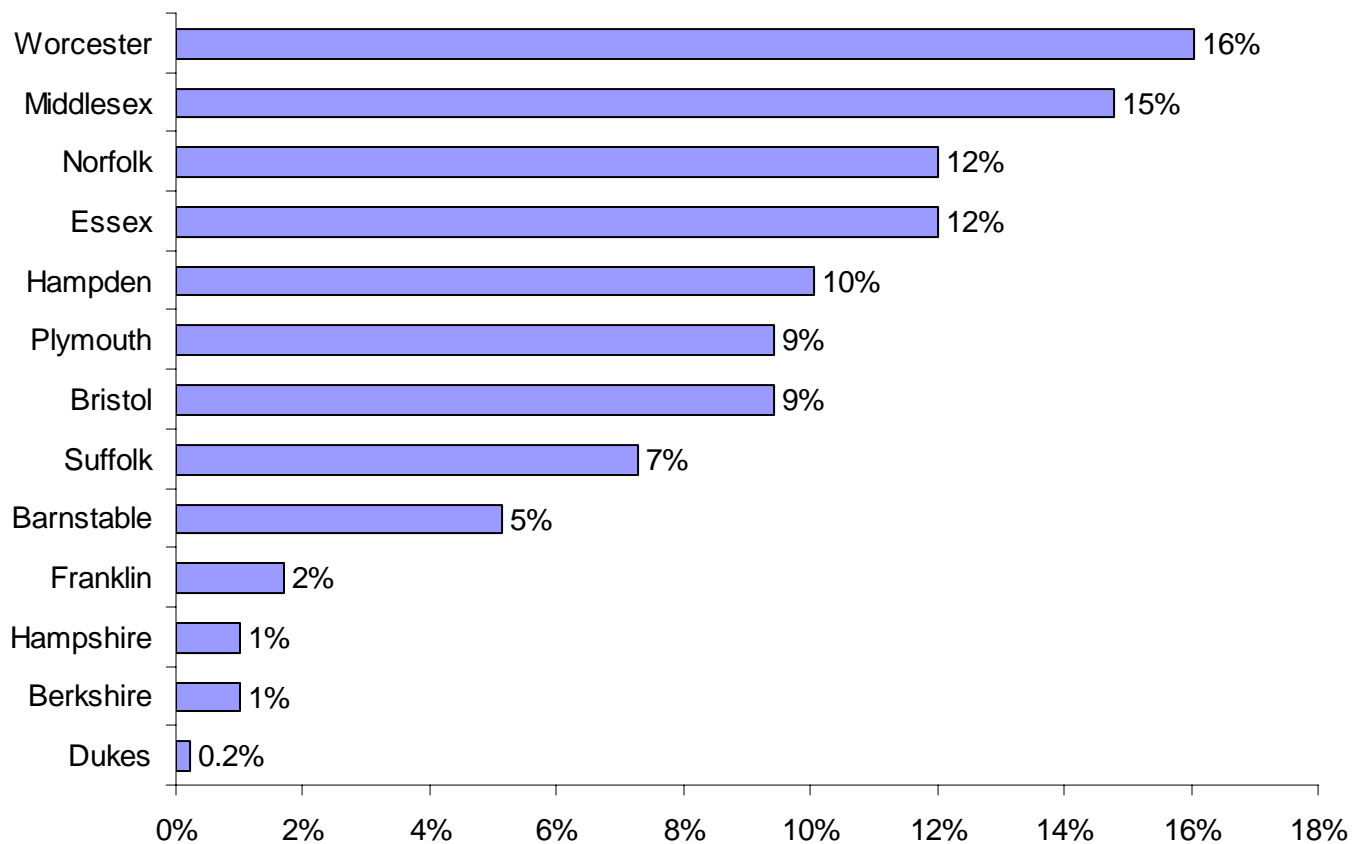


Over 3/4 Involve Passenger Vehicles

Of the 467 motor vehicle fires caused by collisions, 364 involved passenger vehicles. Over two-thirds, 78%, were passenger vehicle fires. Two percent (2%) of these incidents were road freight or transport vehicle fires; and 20% were unclassified motor vehicle fires.

Worcester County Reported the Most Fires

From 2001 through 2009, local Worcester County fire departments reported 75, or 16%, of the 467 motor vehicle fires caused by collision. Middlesex County reported 15% and Norfolk and Essex Counties each reported 12% of these fires. Hampden County reported 10%, Plymouth and Bristol Counties each reported 9%; and Suffolk County reported 7% of these incidents. Barnstable County reported 5%; Franklin County reported 2%; Hampshire and Berkshire Counties each reported 1%; and Dukes County reported less than 1% of these fires. Nantucket County did not report any motor vehicle fires from collisions during this time period.

MV Fires Caused by Collision by County 2001 - 2009

The map on page nine shows the total number of motor vehicle fires caused by collisions reported to MFIRS by county. Worcester County had the highest number reported at 75. Middlesex County had the second highest number of these incidents reported with 69. Norfolk County had 58 of these calls, Essex County reported 54 and Hampden County reported 47 motor vehicle fires caused by collision between 2001 and 2009.

Boston & Springfield Reported the Most Fires

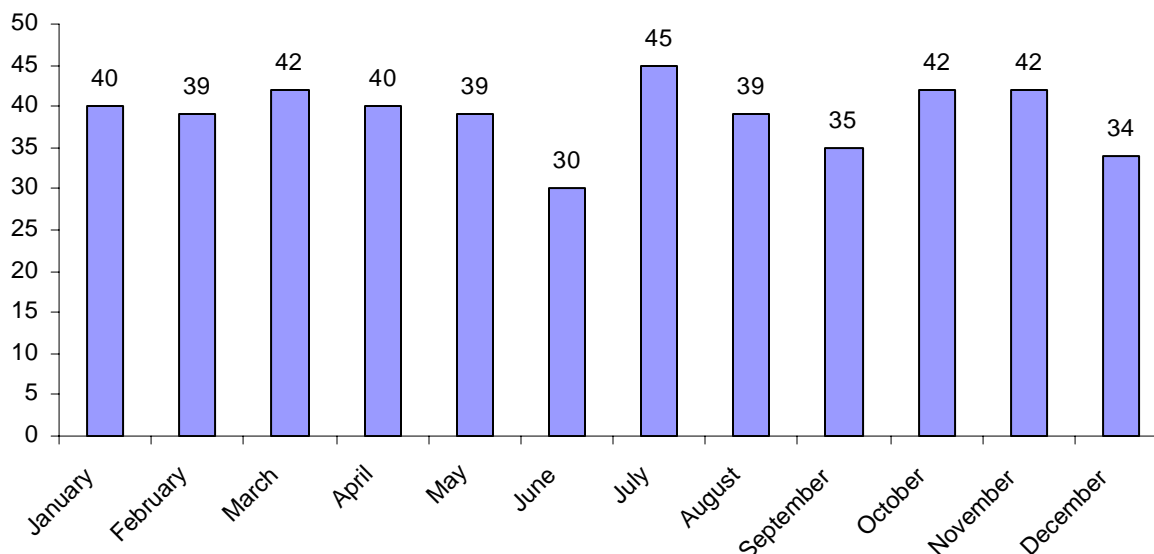
Boston reported the most motor vehicle fires caused by collisions of any local fire department. Boston reported 26 of these fires from 2001 through 2009. Springfield was second with 24 reported fires of this type and Worcester reported the third most with 12. Milton and Swansea each reported 10 of these fires; Plymouth reported nine; and Chicopee, Fall River and Quincy each reported eight motor vehicle fires caused by collisions. In total 155 local fire departments reported at least one of these types of fires.

The map on page 10 shows the total number of motor vehicle fires caused by collisions reported to MFIRS by city or town. Boston had the highest number reported at 26. Springfield had the second highest number of these incidents reported with 24. Worcester had 12 of these calls, and Barnstable, Milton and Swansea each reported 10 motor vehicle fires caused by collision between 2001 and 2009.

Most of These Fires Occur in July

The most prevalent month for motor vehicle fires caused by collision in the Commonwealth was July with a reported 45, or 10%, of these fires. March, October and November each had 42, or 9% of these fires. June was the month with the least amount of these fires. Only 30, or 6%, of these fires occurred in June.

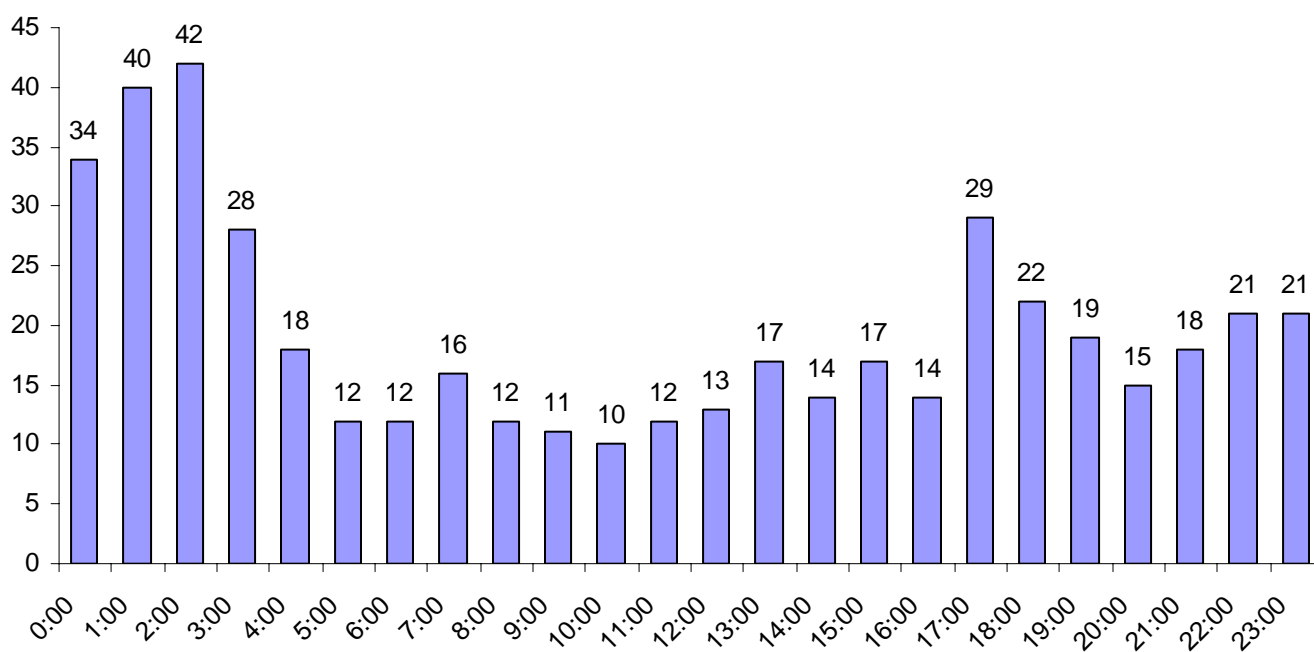
Motor Vehicle Fires Caused by Collision by Month 2001 - 2009



1/4 of These Fires Occur in the Early Morning Hours

One quarter, or 25%, of motor vehicle fires caused by collision occurred between the hours of midnight and 3:00 a.m. The next highest occurrence of these fires were during the evening commute between 5:00 p.m. and 7:00 p.m. The lowest occurrence of these fires were during the morning between 5:00 a.m. and noon with only a small spike at 7:00 a.m. during the morning commute.

Motor Vehicle Fires Caused by Collision by Hour 2001 - 2009



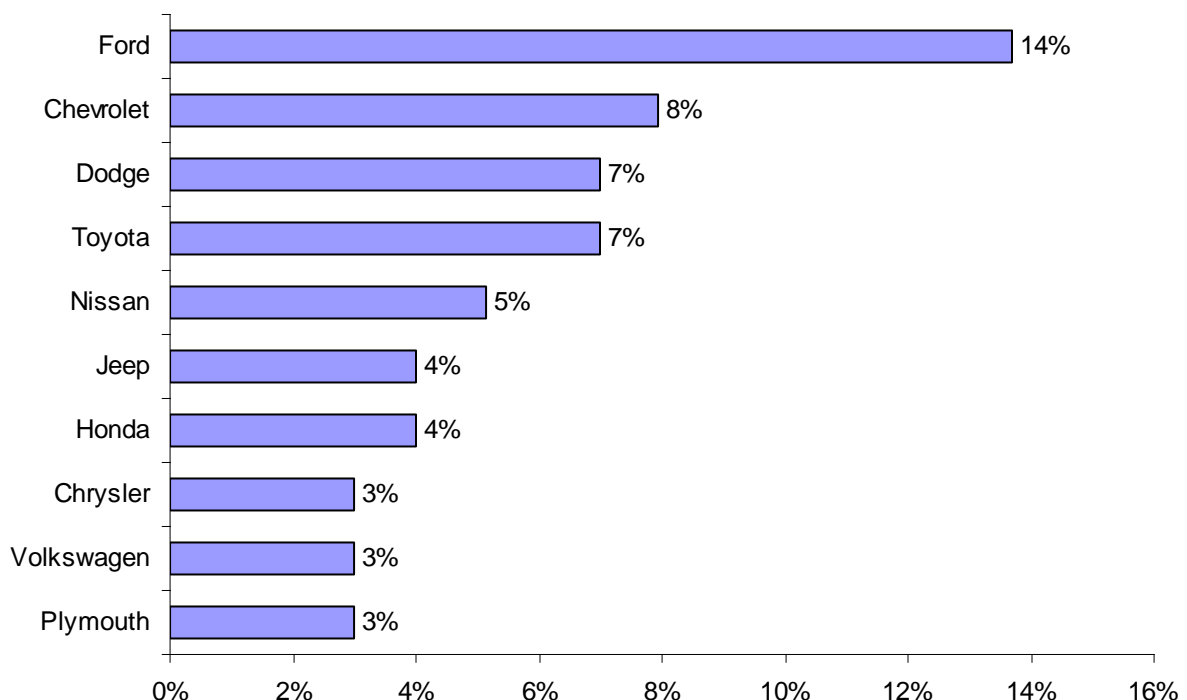
The previous graph shows fire frequency by time of day on the 24-hour clock for motor vehicle fires caused by collision. Midnight to 1:00 a.m. is represented by 0:00, 1:01 a.m. to 2:00 a.m. is represented by 01:00, etc.

Passenger Cars Involved in 80% of Fires

Automobiles or passenger cars were the mobile property type involved in 372, or 80%, of these incidents. Unclassified passenger road vehicles were involved in 11%; semi-trailer freight trucks were involved in 2%; and motorcycles, tanker trucks carrying non-flammable cargo, pickup trucks, general use trucks were each involved in 1% of these fires. Buses, off-road recreational vehicles, unclassified freight road transport vehicles were each involved in less than 1% of these incidents. Unclassified or unreported motor vehicles were involved in 2% of the 467 motor vehicle fires caused by collision in the Commonwealth. While freight trucks hitting bridge abutments garner the big headlines, it is individual passenger cars that are most often involved in these fiery crashes.

Ford was the Leading Mobile Property Make

Of the 467 motor vehicle fires caused by collision, 64, or 14%, involved vehicles manufactured by Ford. Chevrolet was the next leading make at 8%. Dodge and Toyota each accounted for 7% of these vehicles. Nissans were 5%; Jeep and Hondas each accounted for 4%; and Chryslers, Volkswagens and Plymouths were each 3% of the vehicles involved in these incidents between 2001 and 2009.

**MV Fires Caused by Collision by Vehicle Make
2001 - 2009**

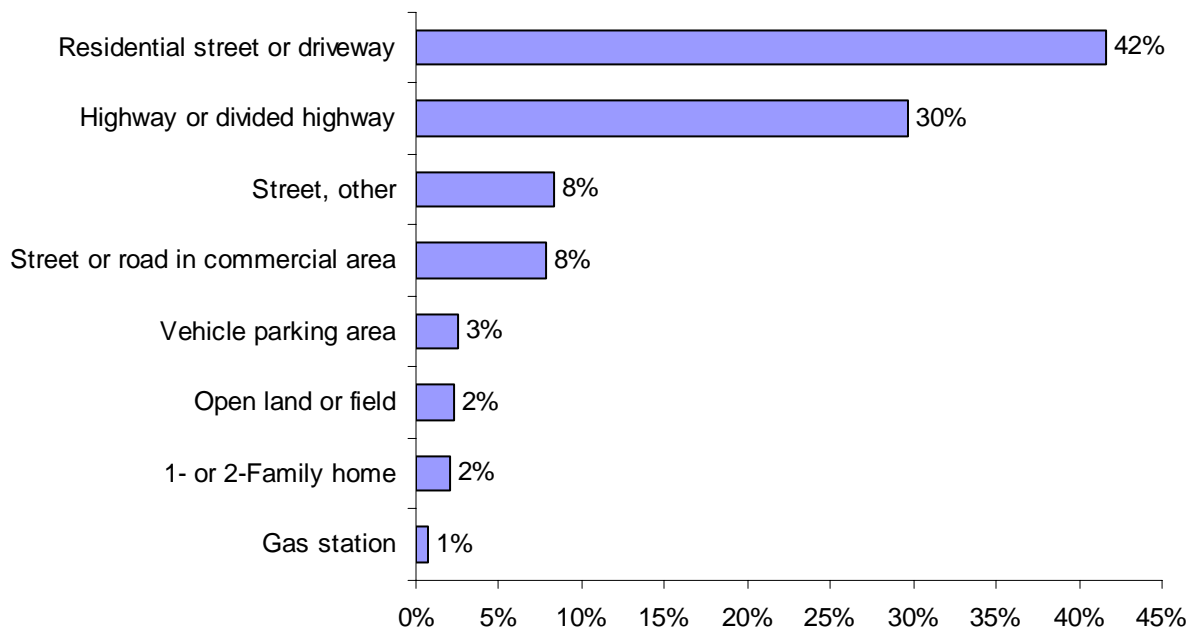
Just because a particular vehicle manufacturer has a higher instance of fires, it should not be assumed that their vehicles are more prone to fires. There could simply be more of that manufacturer's vehicles in Massachusetts. One should not draw any specific conclusions about the above chart without having data on the most popular makes of vehicles in Massachusetts during the same time period.

42% Occurred on Residential Streets & Driveways

Not surprisingly residential streets and driveways were the leading place where most of the motor vehicle fires caused by collision occurred. One hundred and eighty-one, or 42%, of these 467 incidents happened on residential streets or driveways. The second leading property use for these types of incidents was highways where 129, or 30% occurred. Streets in commercial areas and unclassified streets each caused 8% of these

incidents. Three percent (3%) happened in parking lots; 2% occurred in open land or fields and 1-or 2-family homes and 1% happened at gas stations.

Leading Property Use for MV Fires Caused by Collision 2001 - 2009



Almost 3/4 of Fire Started in Engine Area

The leading 'area of origin' for these fires was the engine area of the vehicle. Seventy-one percent (71%) of the 467 reported motor vehicle fires caused by collision began in the engine area. The 'heat source' for almost half, 45%, of these fires was heat or electrical arcing from the vehicle itself. The leading 'item first ignited' was a flammable fuel escaping from the combustion engine, accounting for 22% of these fires. One quarter, or 25%, of all these fires had gasoline as the 'type of material first ignited'. Only 16 of these incidents reported a hazardous materials release. All 16 reported gasoline, diesel fuel or motor oil as the material being released.

Over 3/4 Reported No Human Factors Contributing to Ignition

Three hundred and sixty-seven (367), or 79%, of the 467 reported motor vehicle fires caused by collisions had 'none' reported or did not have any human factor contributing to ignition. Ten percent (10%) of these incidents reported that at least one of the vehicle operators were possibly impaired by alcohol or drugs, and another 4% reported that an operator fell asleep while driving.

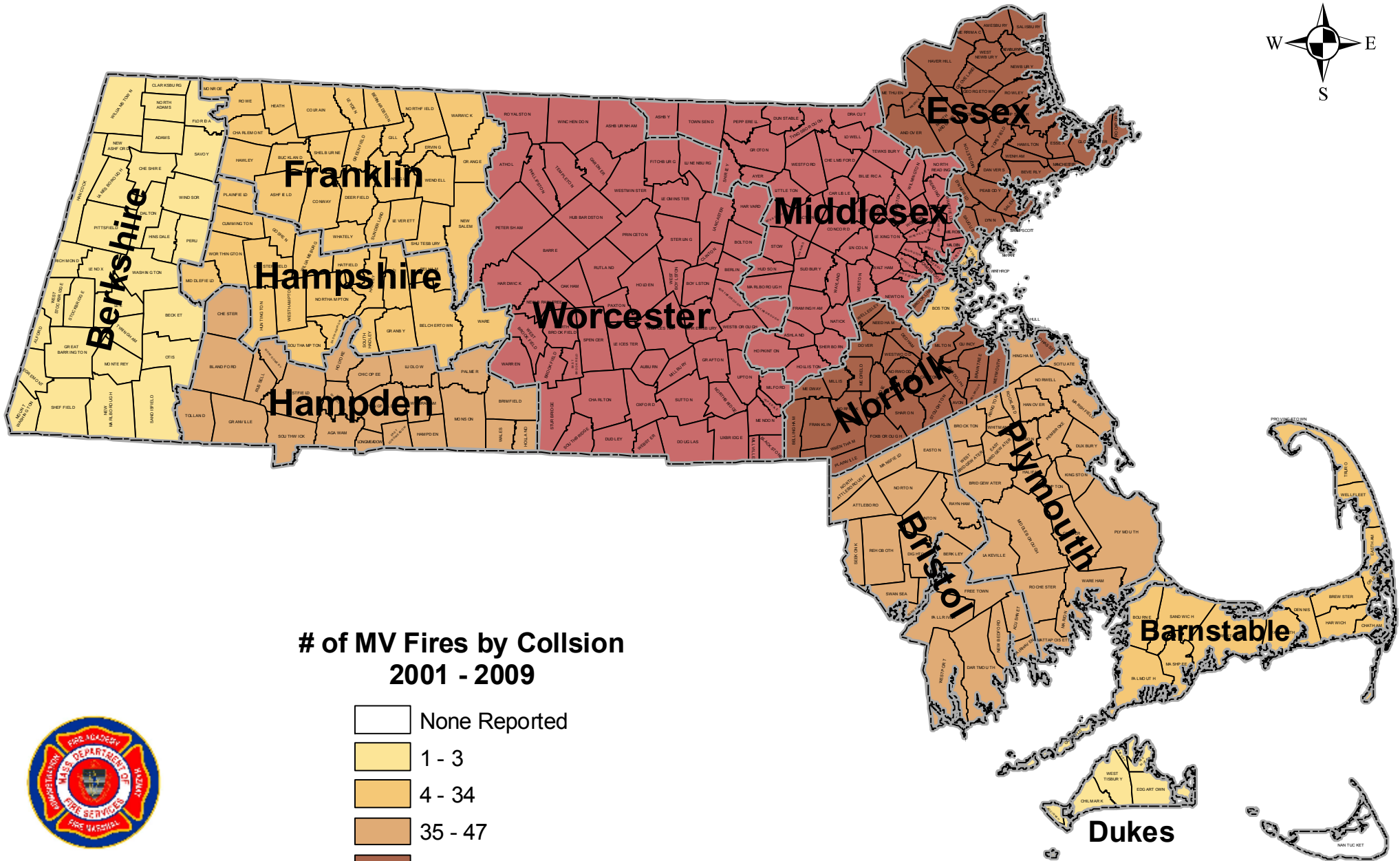
Conclusion

From 2001 to 2009 155 fire departments reported 467 motor vehicle fires caused by collision to MFIRS. These 467 fires caused 18 civilian deaths, 25 civilian injuries, 11 fire service injuries and \$2.8 million in estimated damages. Although not a common occurrence, on average one of these fires occurs weekly. Boston and Springfield were the leading communities where these fires occurred. The largest concentration of these incidents occurred between the hours of midnight and 3 a.m. with another spike at 5 p.m. that correlates with the leading human factors contributing to ignition of possibly impaired by alcohol or drugs and falling asleep. July, October and November were the leading months for these types of fires.

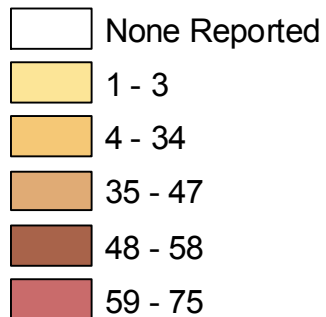
2007 Everett Tanker Accident Leads to Multiple Fires

On December 5, 2007, at 1:31 a.m., the Everett Fire Department responded to a motor vehicle accident and ensuing fire involving a gasoline tanker at the intersection of Sweetzer and Main streets. The tanker truck rolled onto its side discharging its cargo of gasoline into the street. The gasoline ignited and started 42 exposure fires; three building fires and 39 other motor vehicle fires. Fortunately there were no injuries. The total estimated dollar loss of the initial fire and accompanying exposure fires was \$2.1 million.

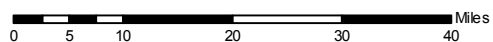
Motor Vehicle Fires from Collisions by County 2001 - 2009



**# of MV Fires by Collision
2001 - 2009**

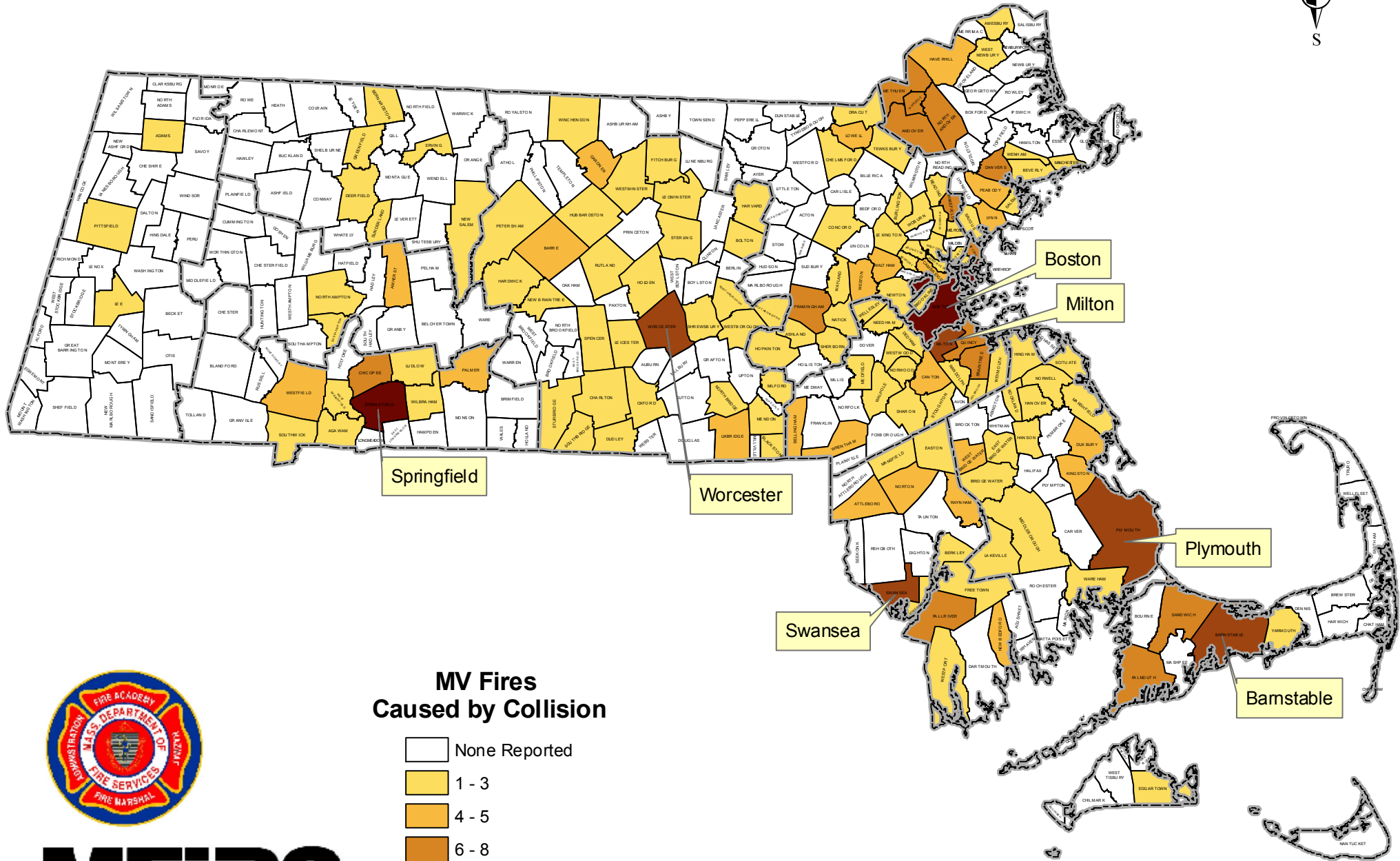


MFIRS
Massachusetts Fire Incident Reporting System



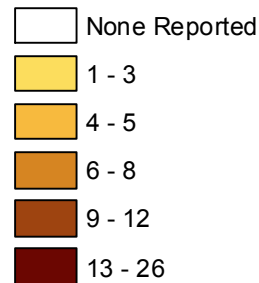
Nantucket

MV Fires Caused by Collision 2001 - 2009



MFIRS
Massachusetts Fire Incident Reporting System

MV Fires Caused by Collision



0 5 10 20 30 40 Miles

Fire Department Response to Motor Vehicle Accidents in Massachusetts 2001 – 2009



MFIRS
Massachusetts Fire Incident Reporting System

Fire Service Assists with MVA & Crash Data Analysis

On July 1, 2009, the Department of Fire Services was awarded a federal Section 408 grant to fund part of a Federal Fiscal Year 2008 application. The Massachusetts Traffic Records Coordinating Committee (TRCC) awarded \$40,284 in part to fund geographic information system (GIS) analysis of reported fire department responses to motor vehicle accidents (MVA's) and calls for emergency medical services (EMS). These funds were used to acquire two sets of software licenses, training for staff, a large scale printer and various related supplies to perform this analysis.

Historically some municipal police departments do not share their accident reports with the various members of the TRCC. The Department of Fire Services is in position to bridge the gap as many municipal fire departments do respond to most MVA's in their jurisdiction and voluntarily submit these reports to the Massachusetts Fire Incident Reporting System (MFIRS). This report is one of three studies that were agreed upon as part of the grant process.

Mandatory Reporting by MA Fire Departments

Under Massachusetts General Law Chapter 148 Section 2, local fire departments are only mandated to report fires or explosions that result in a dollar loss or human casualty and Section 2A, any fire that occurs at a school that has any grades between Kindergarten and grade 12. Fire departments submit these incidents either electronically or on paper to the MFIRS.

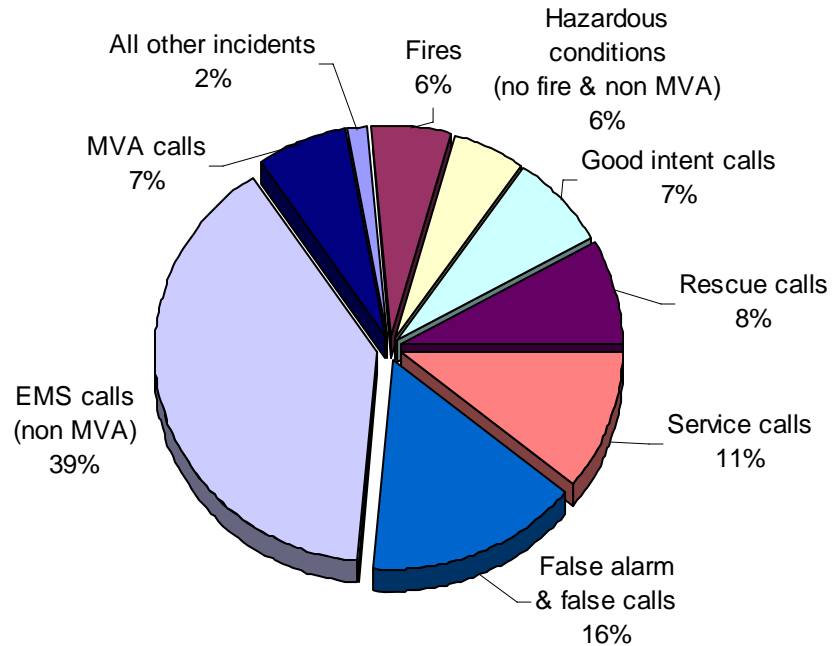
Fire Departments Do More Than Just Fight Fires

Massachusetts fire departments do much more than just fight fires. Over the past couple of decades they have branched out and taken on the added responsibilities for MVA responses, multiple types of specialized rescues, hazardous materials incidents, responding during and after natural disasters, as well as the typical service calls, good intent calls, false alarms and the special types of incidents that do not fit neatly into any of the other categories. These numbers have risen as more fire departments automate their reporting and have voluntarily reported all of their incidents MFIRS

MVA Calls are 44% of All FD Responses

Motor vehicle accident (MVA) incidents represent 7% of the reported incidents in MFIRS. From 2001 through 2009 there were 330,407 reported MVA calls to MFIRS. These 330,407 calls made up 7% of all the calls in MFIRS. This is 1% more than fire calls, which made up 6% of total calls.

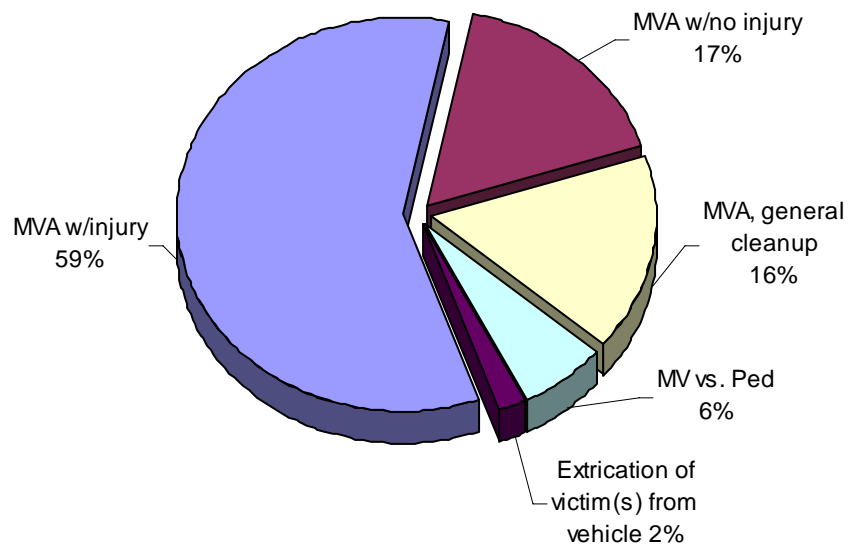
Fire Department Calls by Incident Type 2001 - 2009



MVA with Injury Calls are the Leading Type of MVA Incidents

MVA with injury calls (Incident Type – 322) are when a fire department responds to a call for a motor vehicle accident with reported injuries. From 2001 to 2009 194,254 were voluntarily reported to MFIRS. These types of calls make up 59% of all the types of MVA calls and 4% of all calls of any type. Motor vehicle accidents with no injury

MVA Calls by Type 2001 - 2009

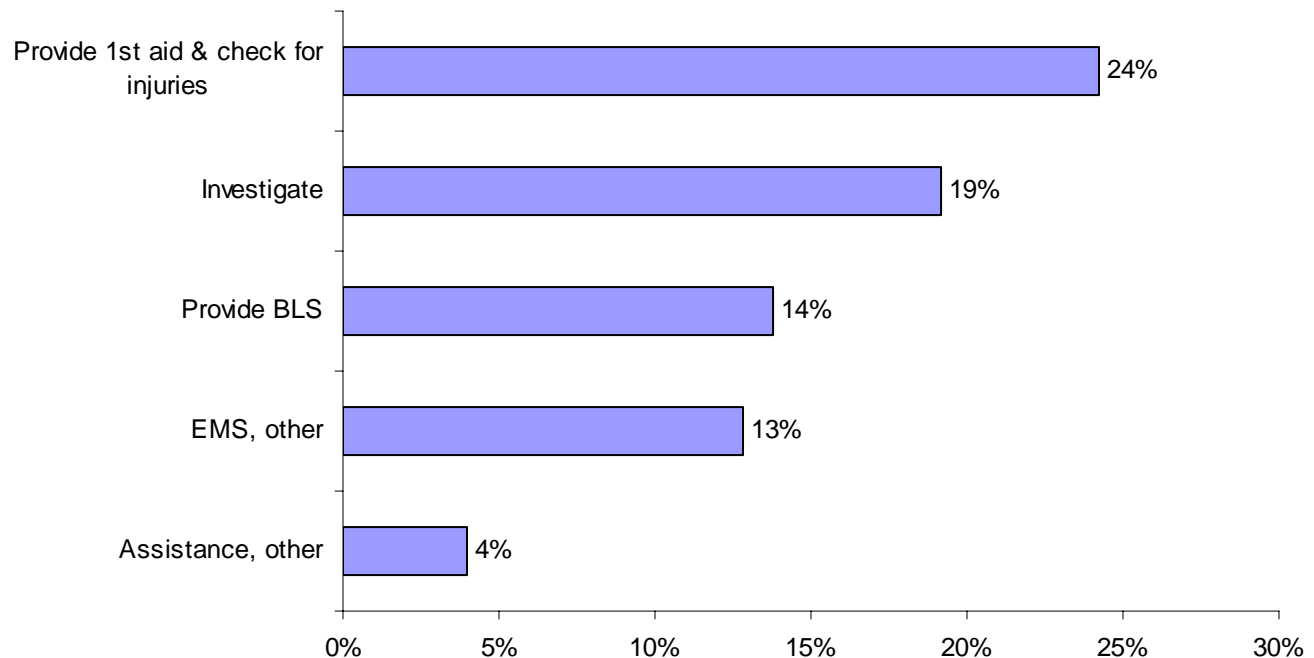


(Incident Type – 324) accounted for 55,797 incidents, or 17% of all MVA type calls and 1% of all reported calls. There were 52,952 motor vehicle accidents needing general cleanup (Incident Type – 463). These calls accounted for 16% of all MVA type calls and 1% of all calls. There were 21,254 motor vehicle accidents involving pedestrians (Incident Type – 323). These calls accounted for 6% of all MVA type calls and less than 1% of all calls. Fire departments reported responding to 6,150 extrication of victims from a vehicle (Incident Type – 352). These calls were the cause of less than 2% of MVA type calls and less than 1% of all types of calls.

Providing 1st Aid is Almost 1/4 of Actions Taken

Of all the reported MVA calls 80,157, or 24%, reported that providing first aid and checking for injuries was the principle action taken while on the call. Investigation was the second leading action taken reported at 19%. Fourteen percent (14%) of the calls reported providing basic life support (BLS) as their primary action taken. Unclassified EMS activities (EMS, other) was the primary action taken for 13% of these calls. Unclassified assistance was reported as the primary action taken in 4% of all MVA calls by Massachusetts fire departments between 2001 and 2009.

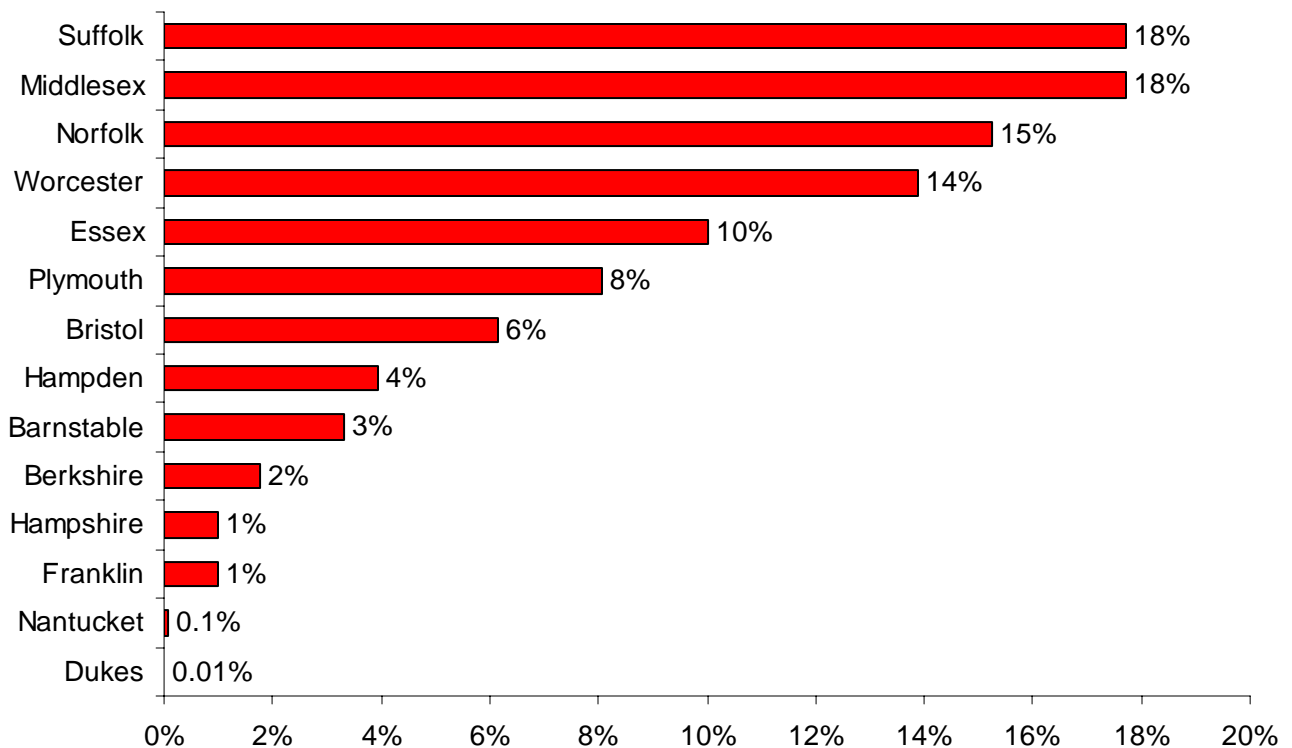
Leading Actions Taken During MVA Calls 2001 - 2009



Suffolk County Reported the Most MVA Type Calls

From 2001 – 2009 fire departments in Suffolk County voluntarily reported the most MVA type calls in Massachusetts. Local fire departments in Suffolk County reported 58,583 calls, or 18%, of all MVA types in MFIRS. Middlesex County fire departments reported 18%, Norfolk County fire departments reported 15% and Worcester County fire departments reported 14% of these calls. Essex County reported 10%; Plymouth County reported 8%; Bristol County reported 6% and Hampden County reported 4% of all MVA calls. Barnstable County reported 3%; Berkshire County reported 2%; Hampshire and Franklin Counties each reported 1%; and Nantucket and Dukes County each reported less than 1% of all MVA type calls in the Commonwealth.

MVA Calls by County 2001 - 2009

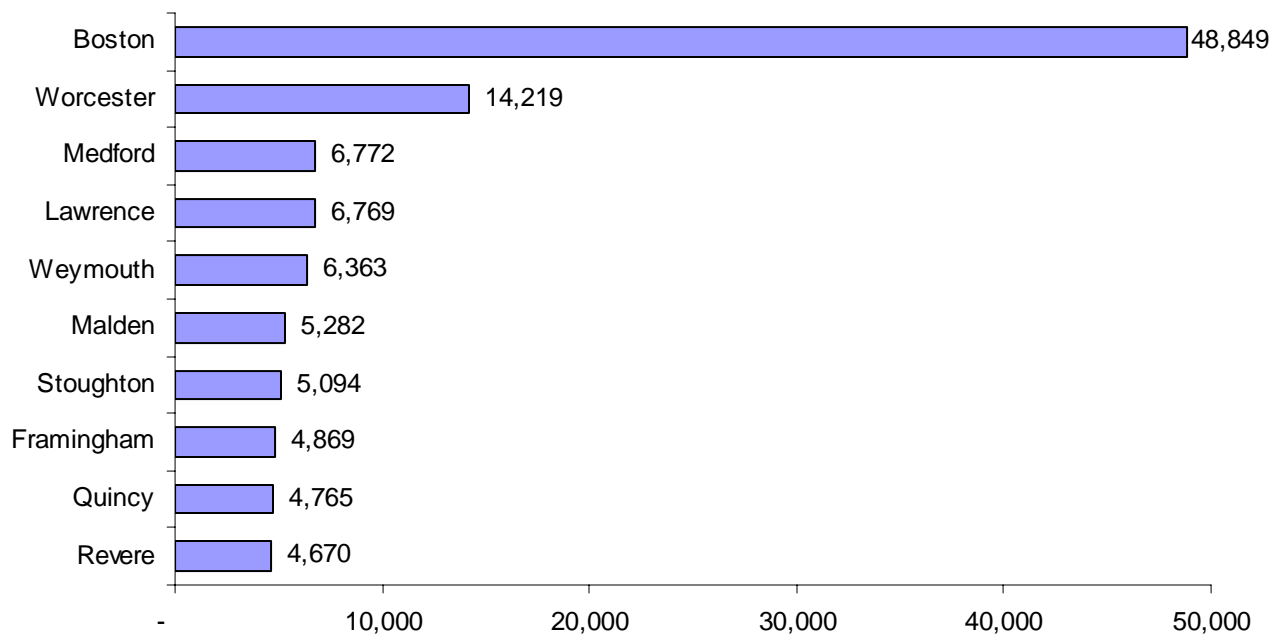


The map on page 15 shows the five-year average (2005 - 2009) of MVA calls reported to MFIRS by county. Middlesex County had the highest average with 8,311 EMS runs reported per year. Suffolk County had the second highest average with 7,833 runs reported annually. Norfolk, Worcester and Essex Counties rounded out the top five counties that reported the most MVA runs to MFIRS from 2005 through 2009.

Boston Reported Most MVA Type Calls of Any Local Fire Department

From 2001 – 2009 the Boston Fire Department voluntarily reported 48,849¹ MVA type calls. This represents 15% of all these calls statewide and over 3.4 times more than the second leading department, Worcester. Worcester reported 14,219; Medford reported 6,772; Lawrence reported 6,769 and Weymouth reported 6,363 MVA calls of all types. Malden (5,282), Stoughton (5,094), Framingham (4,869), Quincy (4,765), and Revere (4,670) round out the top 10 of fire departments reporting these calls in Massachusetts.

Leading Fire Departments Reporting MVA Incidents 2001 - 2009

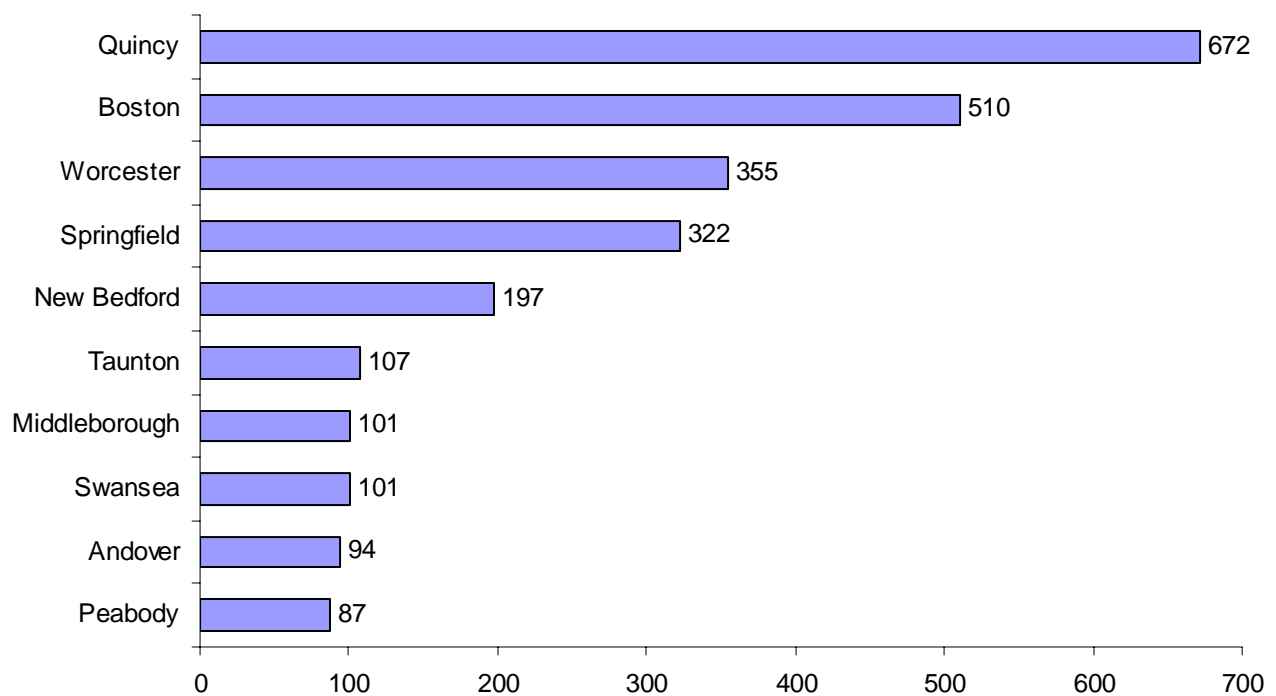


The map on page 16 shows the five-year average (2005 - 2009) of MVA runs reported to MFIRS by city or town. Boston had the highest average with 6,727 MVA runs reported per year. Worcester had the second highest average with 1,999 runs reported annually. Medford, Weymouth and Lawrence round out the top five communities that reported the most MVA runs to MFIRS from 2005 through 2009.

¹ Boston didn't report these types of calls in 2001 or 2002; they started reporting all of their calls in 2003. Using the average for the seven years that they did report MVA type calls of 6,978 per year to complete 2001 & 2002, Boston would have 62,806 MVA type calls, reporting over 4.4 times more than Worcester.

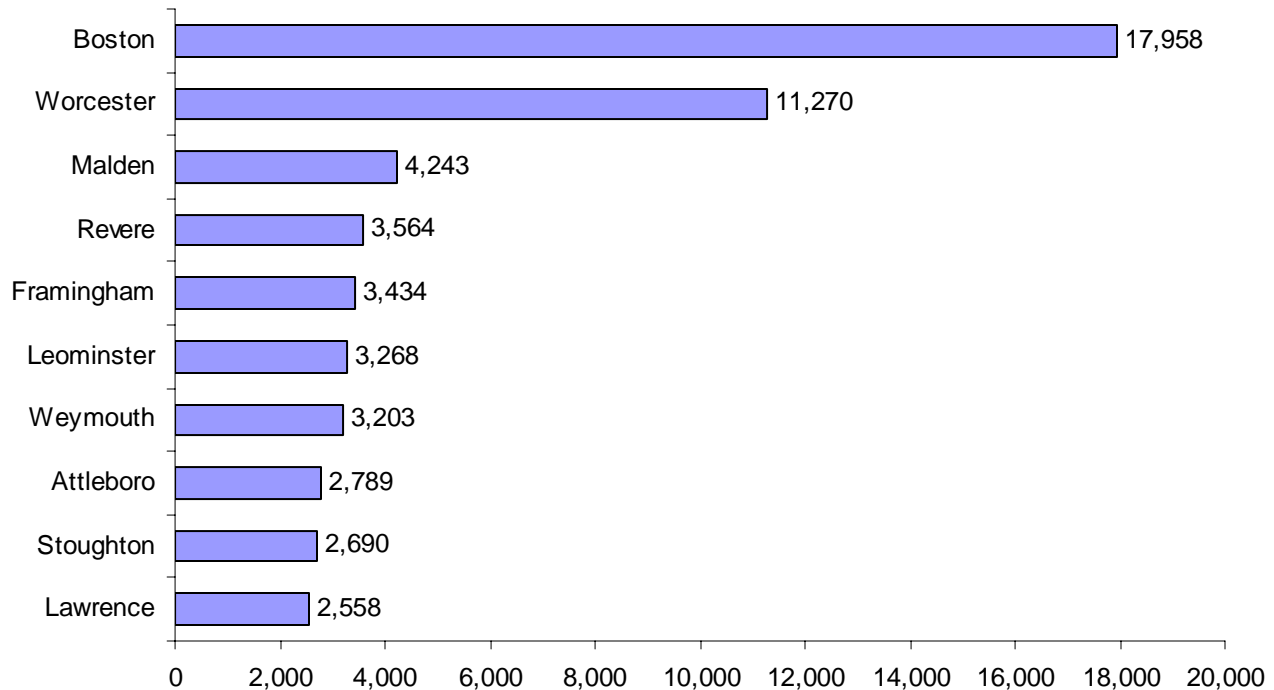
Quincy Reported the Most Vehicle Extractions

Massachusetts fire departments voluntarily reported 6,150 extractions of persons from vehicles to MFIRS from 2001 through 2009. The Quincy Fire Department reported the most auto extractions of victims. They reported 672 extractions, or 11% of the total number of extractions reported. Boston was the second leading reporter with 510 extractions. Worcester reported the third most with 355; Springfield reported 322; and New Bedford reported 197. Taunton reported 107 extractions; Middleborough and Swansea each reported 101 extractions; Andover reported 94 vehicle extractions; and Peabody reported 87 rounding out the top 10 departments in the state.

Auto Extrication of Victims 2001 - 2009

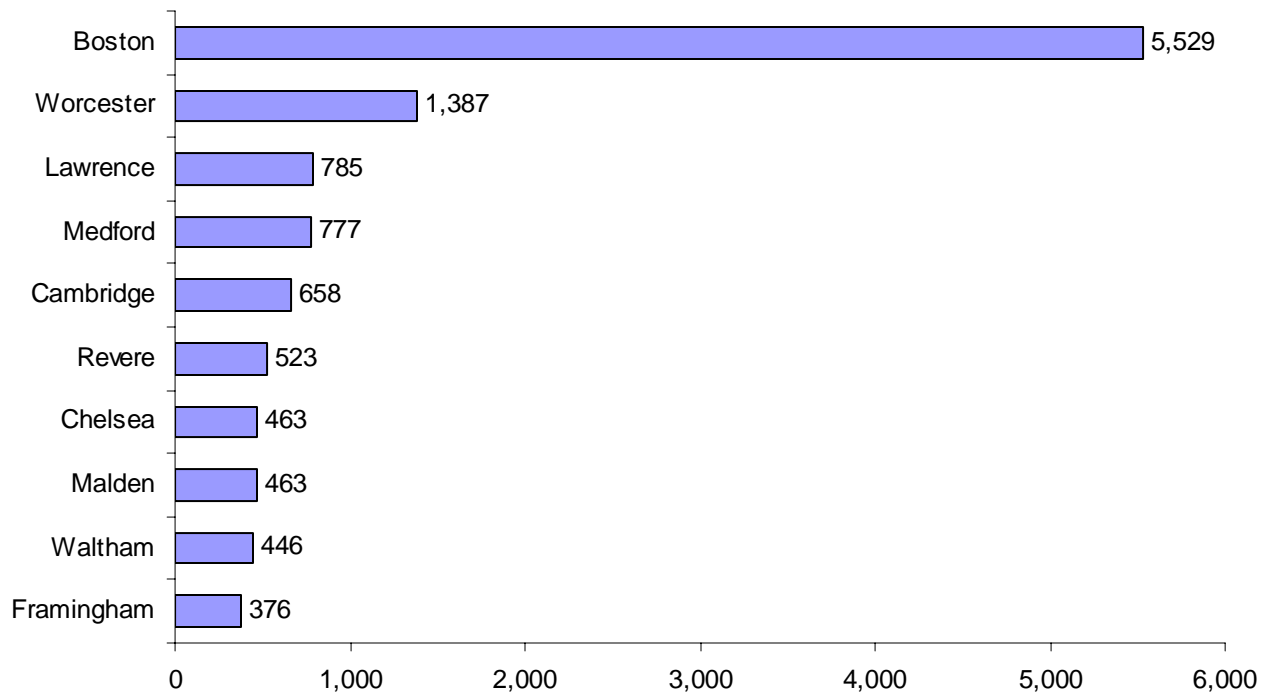
Boston Reported the Most Vehicle Accidents with Injuries

From 2001 through 2009 local Massachusetts fire departments reported that they responded to 194,254 motor vehicle accidents with injuries. Boston, reported the most of these calls with 17,958 even though they did not report these types of calls in 2001 and 2002. These 17,958 Boston calls represent 9% of the total 194,254 motor vehicle accidents with injuries. Worcester with 11,720 of these calls reported the second most accidents with injuries. Malden was third with 4,243; Revere was fourth with 3,564; and Framingham reported the fifth most accidents with injuries, 3,434. Leominster (3,268), Weymouth (3,203), Attleboro (2,789), Stoughton (2,690), and Lawrence (2,558) round out the top 10 or responding to motor vehicle accidents with injuries.

Motor Vehicle Accident with Injury 2001 - 2009

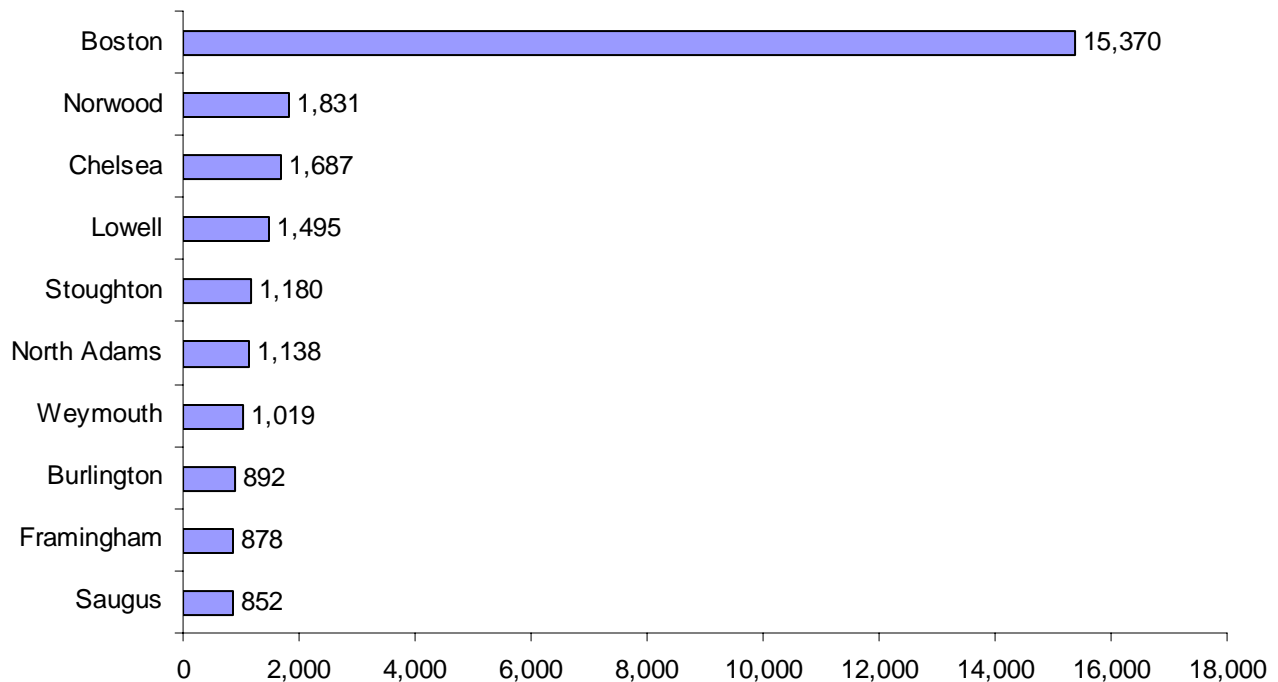
Boston Had Over 1/4 of Motor Vehicle vs. Pedestrian Accidents

From 2001 to 2009 Massachusetts fire departments voluntarily reported that they responded 21,254 incidents involving a motor vehicle striking a pedestrian (MV vs. pedestrian). Boston reported the most of these types of accidents with 5,529, or 26%. This was four times more than the department with the second most motor vehicle vs. pedestrian incidents. Worcester reported the second most with 1,387. Lawrence reported 785 of these incidents ranking it third behind Boston and Worcester. Medford reported 777 and Cambridge went to 658 of these calls. Revere (523), Chelsea (463), Malden (463), Waltham (446), and Framingham (376) round out the top 10 for reported motor vehicle vs. pedestrian accidents in Massachusetts.

Motor Vehicle vs. Pedestrian Accidents 2001 - 2009

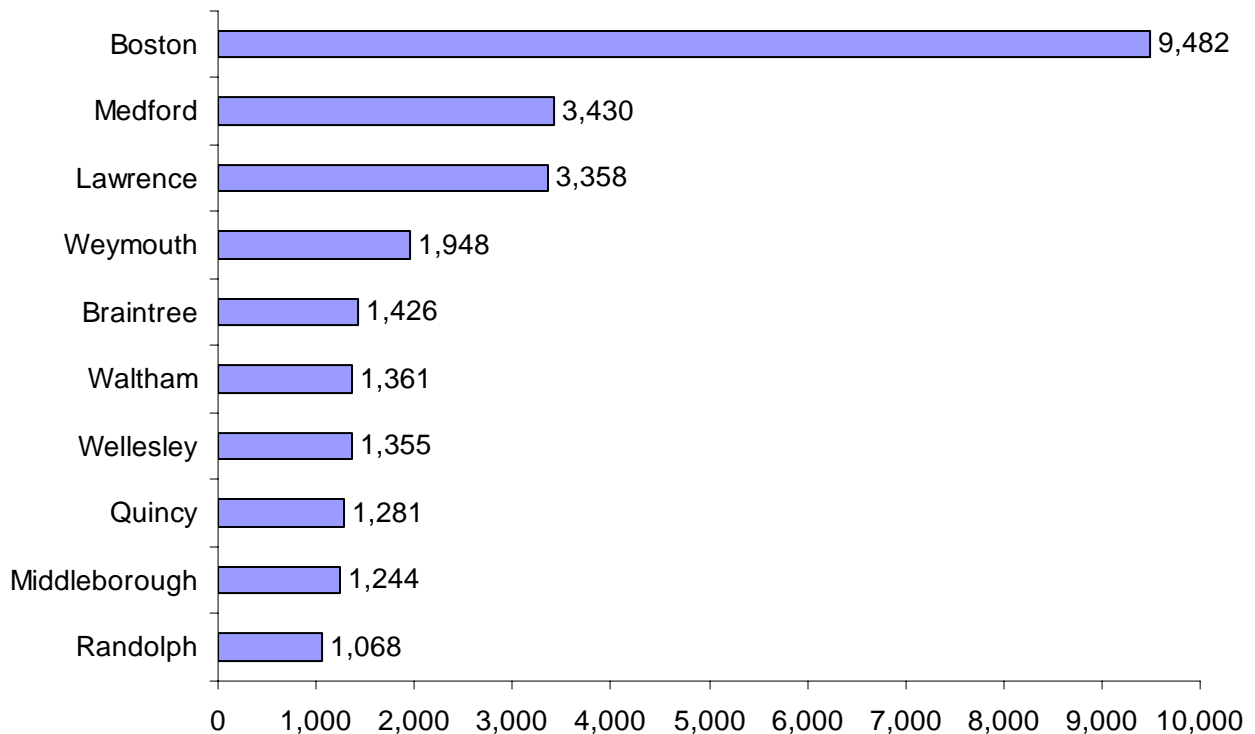
Boston Had Over 1/4 of Motor Vehicle Accidents with No Injuries

From 2001 to 2009 Massachusetts fire departments voluntarily reported that they responded 55,797 incidents involving a motor vehicle accidents without an injury (MVA w/out injury). Boston reported the most of these types of accidents with 15,370, or 28%. This was 8.4 times more than the department with the second most motor vehicle accidents without an injury. Norwood reported the second most with 1,831. Chelsea reported 1,687 of these incidents ranking it third behind Boston and Norwood. Lowell reported 1,495 and Stoughton reported going to 1,180 of these calls. North Adams (1,138), Weymouth (1,019), Burlington (892), Framingham (878), and Saugus (852) round out the top 10 for reported motor vehicle accidents without an injury in Massachusetts.

Motor Vehicle Accident Without Injury 2001 - 2009

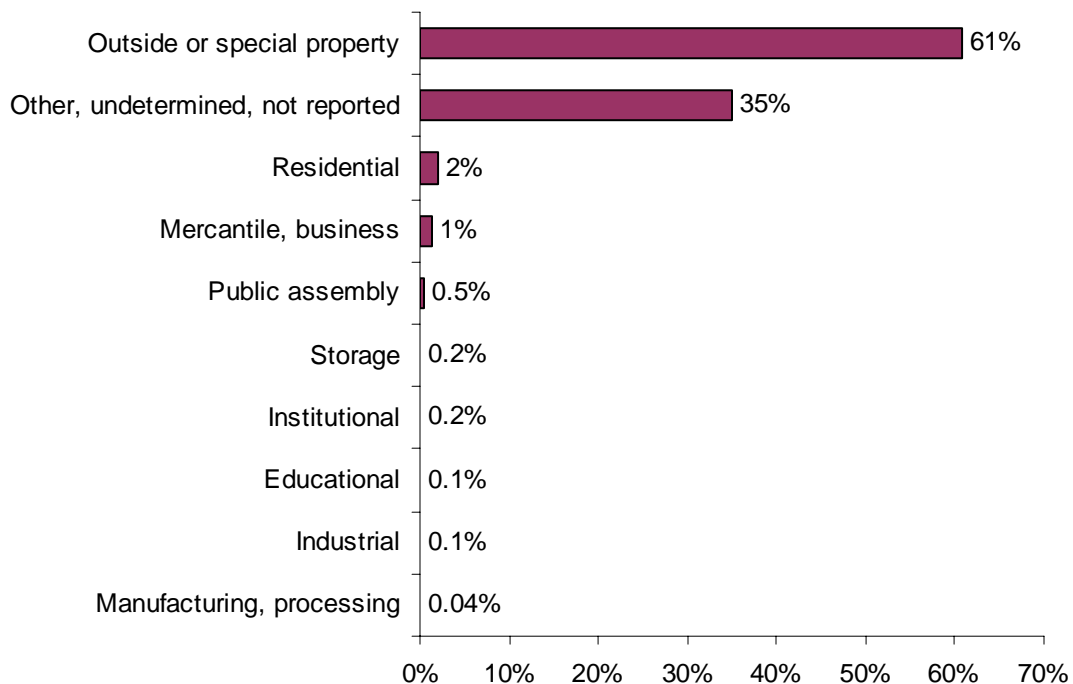
Boston Had Most Motor Vehicle Accidents with General Cleanup

From 2001 to 2009 Massachusetts fire departments voluntarily reported that they responded 52,952 incidents involving a motor vehicle accidents without an injury (MVA general cleanup). Boston reported the most of these types of accidents with 9,482, or 88%. This was 2.8 times more than the department with the second most motor vehicle accidents without an injury. Medford reported the second most with 3,430. Lawrence reported 3,358 of these incidents ranking it third behind Boston and Norwood. Weymouth reported 1,948 and Braintree reported going to 1,426 of these calls. Waltham (1,361), Wellesley (1,355), Quincy (1,281), Middleborough (1,244), and Randolph (1,068) round out the top 10 for reported motor vehicle accidents without an injury in Massachusetts.

**Motor Vehicle Accident General Cleanup
2001 - 2009**

61% of All MVA Type Calls Occur Outside

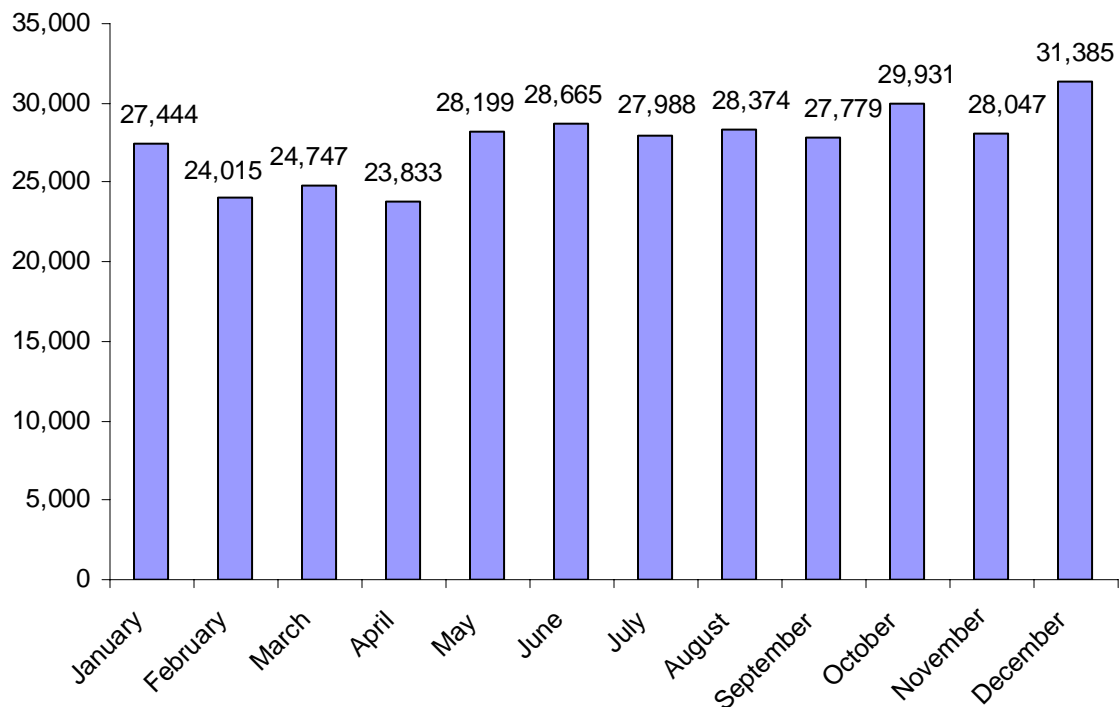
Of the 330,407 MVA type calls, 290,194, or 61%, occurred on or in an outside or special property. This is not surprising as most motor vehicle accidents occur outside on streets or highways. Undetermined, not reported or *Other* type properties were the second leading property use for these types of calls accounting for 35%. Two percent (2%) occurred at residential properties. Mercantile or business properties accounted for 1% and less than 1% occurred at public assembly occupancies, storage facilities, educational properties, industrial facilities and manufacturing or processing facilities.

MVA Calls by Property Use 2001 - 2009

MVA Type Calls Most Common in December & October

December was the peak month for these incidents. October ranked second and June had the third largest number of MVA calls. The late winter and early Spring months had significantly fewer calls of these types. The fewest MVA calls occurred in April.

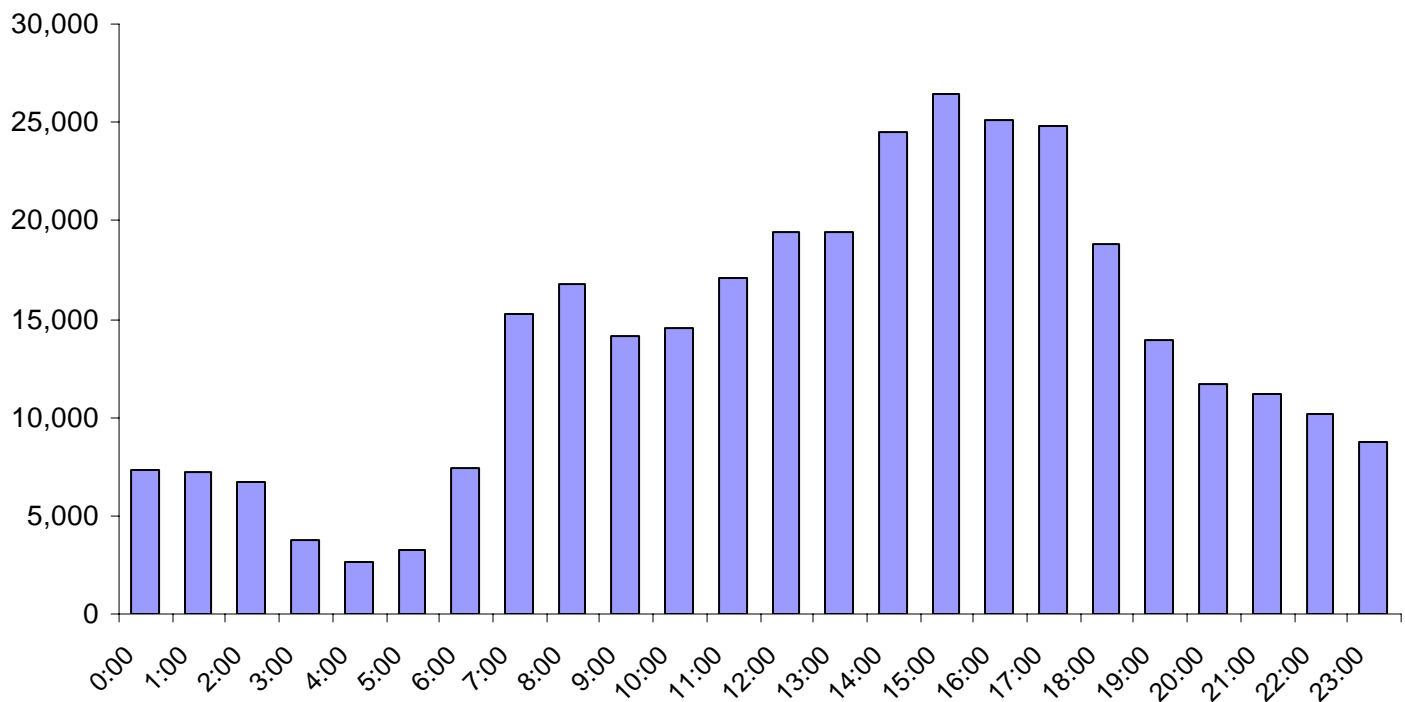
February had the second lowest frequency of these incidents, and March had the third lowest number of MVA type calls from 2001 - 2009.

MVA Calls by Month 2001 - 2009

MVA Type Call Most Common After Lunch Time

MVA type calls occurred most often after lunchtime. They reached their lowest point between 1:00 a.m. and 7:00 a.m. and increased fairly steadily to a peak between 2:00 p.m. and 5:00 p.m. Thirty-six percent (36%) of all of these calls occurred during one-fifth of the day, between the hours of 2:00 p.m. and 6:00 p.m.

MVA Calls by Hour 2001 - 2009

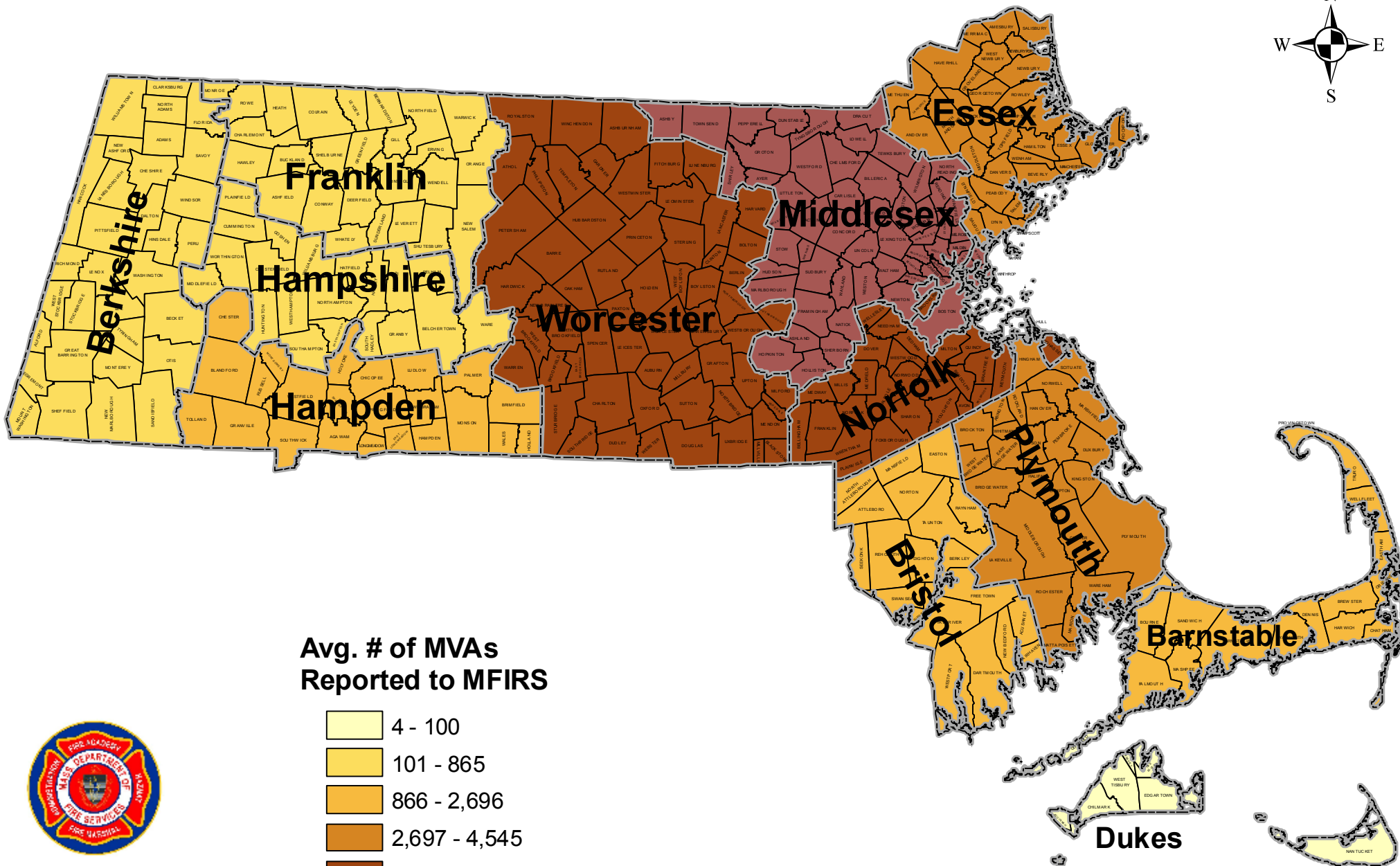
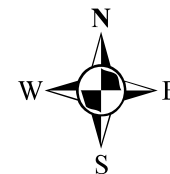


The previous graph shows fire frequency by time of day on the 24-hour clock for motor vehicle accidents. Midnight to 1:00 a.m. is represented by 0:00, 1:00 a.m. to 2:00 a.m. is represented by 1:00, etc.

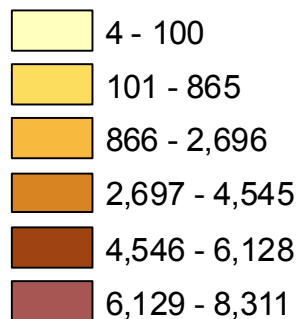
Conclusion – MVA Incidents = 7% of Fire Department Calls

MVA incidents make up 7% of all calls in MFIRS from 2001 through 2009, that is 1% more than fire responses during the same period. During these calls providing first aid, checking for injuries, investigating and providing basic life support to a patient were the leading actions taken. Most of these types of calls happen in December, October and June; and occur between lunch and dinnertime. Most of these accidents occurred in Suffolk and Middlesex Counties; but Boston and Worcester, the two largest communities in the state reported responding to the most motor vehicle accidents.

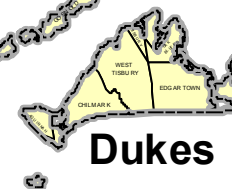
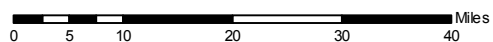
Average Number of Motor Vehicle Accidents by County 2005 - 2009



**Avg. # of MVAs
Reported to MFIRS**



MFIRS
Massachusetts Fire Incident Reporting System

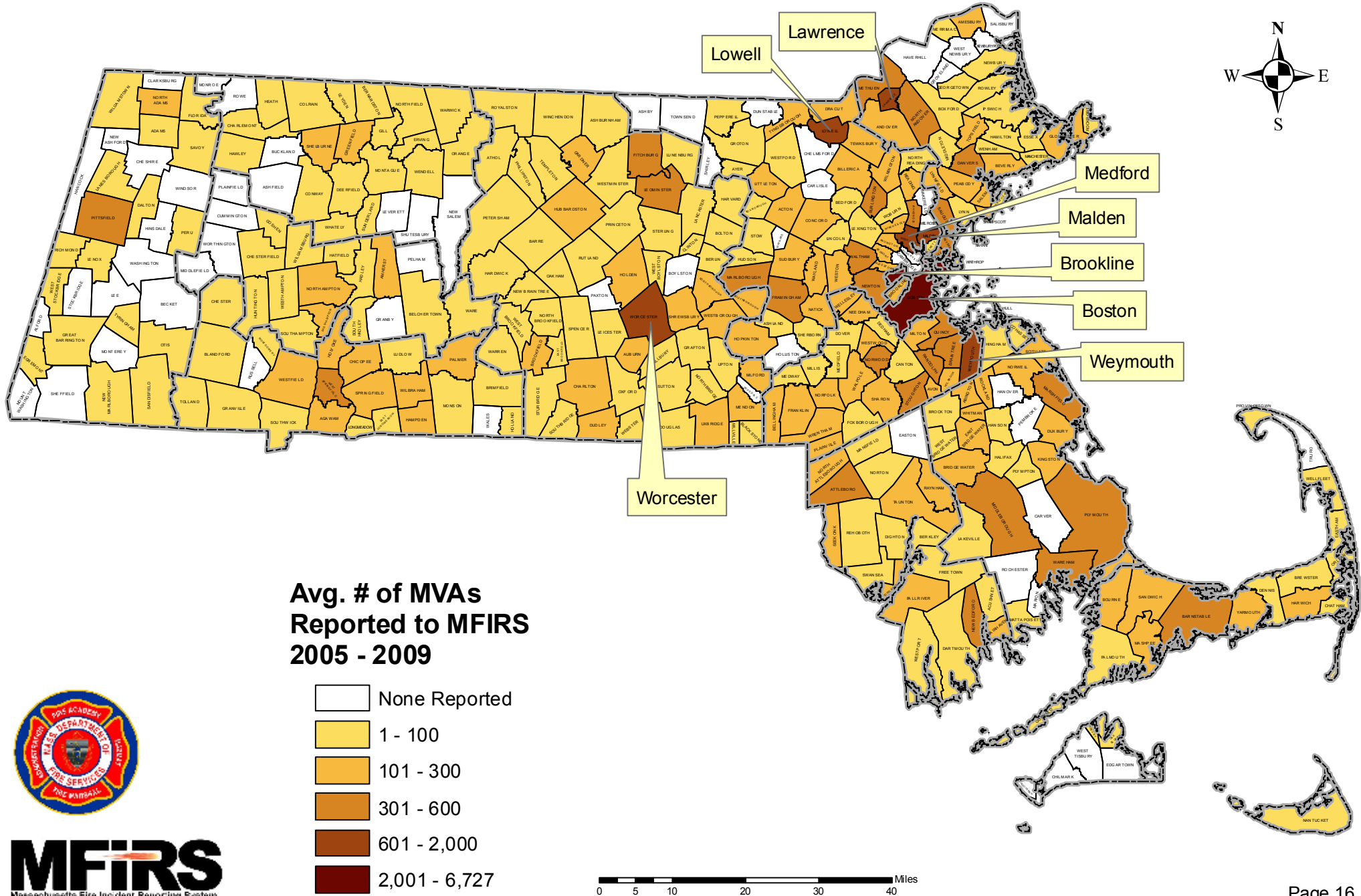


Dukes



Nantucket

Average Number of Motor Vehicle Accidents Reported to MFIRS 2005 - 2009



Department of Homeland Security Assistance to Firefighters Grant Program 2011 Workshops



The Department of Fire Services and Homeland Security Grants and Training will conduct nine workshops for fire departments requiring assistance with applications for funding under the next round of the Assistance to Firefighters Grant Program. Mr. David Parr, Regional Fire Program Specialist, will explain in detail the application procedure and time lines for preparation and submission.

Date	Location	Time	Seminar #
June 9th	JAFFREY FIRE STATION Turnpike Road, Jaffrey, NH	1900-2200	200-000-524 I
June 14th	FALL RIVER FIRE DEPARTMENT 140 Commerce Drive, Fall River, MA	1300-1600	200-000-524 A
June 15th	GREAT BARRINGTON FIRE DEPARTMENT 37 State Road, Great Barrington, MA	1300-1600	200-000-524 B
June 15th	DALTON FIRE DEPARTMENT 20 Flansburg Avenue, Dalton, MA	1900-2200	200-000-524 C
June 16th	SPRINGFIELD FIRE TRAINING FACILITY 100 Grochmal Avenue, Springfield, MA	0930-1230	200-000-524 D
June 27th	MASSPORT FIRE RESCUE 162 Harborside Drive, East Boston, MA	0930-1230	200-000-524 E
June 27th	ANDOVER FIRE DEPARTMENT 32 No. Main Street, Andover, MA	1330-1630	200-000-524 F
June 28th	BOURNE FIRE DEPARTMENT, STATION 3 51 Meetinghouse Lane, Sagamore, MA	0930-1230	200-000-524 G
June 29th	DEPARTMENT OF FIRE SERVICES One State Road, Stow, MA	1330-1630	200-000-524 H

Pre-registration is required.

Complete the standard DFS/MFA student application and Fax to 978 567-3229 or you may also use our on-line registration form at www.mass.gov/dfs



*** *Register Early!* ***

FIRE PREVENTION JUNE SCHEDULE 2011



CMR 2 – FIREWORKS

The Board of Fire Prevention and Regulations recently adopted an updated version of CMR 2 to include new NFPA referenced standards 1123, 1124 and 1126. This training will review the updated standards, as well as changes made to 527 CMR 2.

State Police Lt. Jeanne Stewart will present a short segment on fireworks enforcement and education steps police and fire officials can take to prevent illegal fireworks use and illegal bon fires both in advanced of the 4th of July and over the holiday weekend. Fire officials should encourage local police to attend the seminar with them.



Course #: 200-000-679-H

Date: June 21, 2011

Time: 1000-1300

Location: Department of Fire Services

Please complete a standard DFS / MFA student application or register online at www.mass.gov/dfs

Mail to: Registrar
Massachusetts Firefighting Academy
State Road, P.O. Box 1025, Stow, MA 01775
(978) 567-3200

Or Fax to:
(978) 567-3229



Register Early!!



FIRE PREVENTION JUNE SCHEDULE 2011



8TH EDITION OF THE STATE BUILDING CODE

The new 8th Edition of the Massachusetts State Building Code (780 CMR) became effective on February 7, 2011 for all commercial and multi-family buildings being constructed or undergoing renovation (does not include one and two family dwellings or townhouses up to three-stories in height). The program will introduce the new 8th Edition and its relationship with the 2009 International Building Code, the 2009 International Fire Code, the Massachusetts State Fire Code (527 CMR) and the 2009 International Existing Building Code. The program will be based on the fire protection requirements and often-confused provisions in 780 CMR Chapters 4.00 and 9.00. Several tabletop exercises will reinforce the material. 780 CMR Chapter 34.00 will be briefly highlighted. Students must bring in their codebooks mentioned above, as well as the 780 CMR front-end amendment packages to meaningfully participate in this program (codebooks will NOT be supplied on-site).

Course #:	200-000-636 Session G
Date:	June 28, 2011
Time:	0900-1300
Location:	Andover Town House Banquet Facility 20 Main Street Andover, MA

Please complete a standard DFS / MFA student application or register online at www.mass.gov/dfs.

Mail to: Registrar
Massachusetts Firefighting Academy
State Road, P.O. Box 1025, Stow, MA 01775
(978) 567-3200

Or Fax to:
(978) 567-3229

"Class size will be limited. Watch next month for additional offerings."



Department of Fire Services / Division of Fire Safety – Code Enforcement Training

SAVE the DATE



Setting Sail for New Horizons

SEPTEMBER 21-22, 2011

THE 17TH ANNUAL

Fire & Life Safety Education Conference

*Presented by the Department of Fire Services and the
Massachusetts Public Fire & Life Safety Education Task Force*

WESTFORD REGENCY INN AND CONFERENCE CENTER

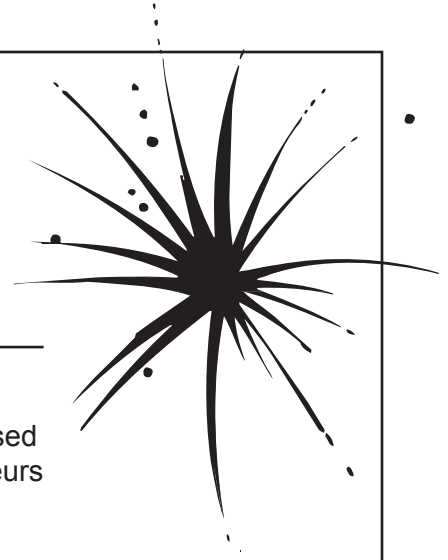
219 Littleton Road (Route 110) • Westford, MA 01886

FOR REGISTRATION INFORMATION:

Send an e-mail with the text "conference" in the subject line to Jennifer.Mieth@state.ma.us

Look online at www.mass.gov/dfs under *What's New*

Be Smart... Leave the Fireworks to the Professionals



Enjoy the many supervised professional displays!

All across the state there are many professional fireworks displays supervised by local fire departments. Unfortunately, too many children and adult amateurs continue to set off fireworks that start fires, and cause serious injuries to themselves and others.

Fireworks can be deadly!

A 45-year old Gloucester woman died in a December 22, 2003 house fire when someone threw fireworks and ignited the Christmas tree in the living room. Three other people were injured. On May 20, 1997, a 26-year old man from Watertown was killed while he was lighting fireworks in a hallway. A 27-year old Framingham man was killed July 4, 1993, when his backyard fireworks exploded in his face. On July 4, 1992, fireworks fatally injured a 30-year old man on a Fairhaven beach.

All fireworks are illegal in Massachusetts.

The possession and use of all fireworks by private citizens is illegal in Massachusetts. This includes Class C fireworks which are sometimes falsely called "safe and sane" such as sparklers, party poppers, snappers, firecrackers, spinners and cherry bombs, to name a few. Sparklers burn at 1800°F.

It is illegal to transport fireworks into Massachusetts, even if they were purchased legally elsewhere. Illegal fireworks can be confiscated on the spot.

Do not purchase fireworks through mail-order or on-line catalogues.



The distribution of mail-order catalogues that clearly state that fireworks are illegal in some jurisdictions cannot be prohibited. State and local police regularly confiscate illegal shipments of fireworks into Massachusetts. Many unhappy consumers have lost both their money and the fireworks trying to circumvent the law.

Set a good example for your children.

Children imitate what they see adults do.

If you use fireworks children will imitate you, not realizing how very dangerous they are. Over sixty-five percent of the fireworks-related burn injuries reported by hospitals to the Office of the State Fire Marshal were children under age 18.

(over)



FireFACTORS

Office of the State Fire Marshal • Department of Fire Services

P.O. Box 1025 State Road Stow, MA 01775 (978) 567-3300 www.mass.gov/dfs

MFIRS facts!

In the past decade (2001-2010) there have been 774 major fire and explosion incidents involving illegal fireworks reported to the Massachusetts Fire Incident Reporting System (MFIRS). These 774 fires and explosions caused one civilian fatality, 10 civilian injuries, six fire service injuries, and an estimated dollar loss of \$2.4 million. This is quite a substantial amount since most fireworks related fires are outside brush fires and do not usually have high loss figures.

- On March 7, 2010, at 7:14 p.m., the Greenfield Fire Department was dispatched to a fire in a two-family home. Someone was using fireworks and they ignited an exterior wall of the building. Damages from this fire were estimated to be \$3,000.
- On July 3, 2010, at 9:53 p.m., the Norwood Fire Department was called to a structure fire in a shed that was started by fireworks. The fireworks also ignited a nearby fence, and damages were estimated to be \$7,500.
- On July 3, 2010, at 10:02 p.m., the Canton Fire Department was called to a shed on fire at a dump that spread to a nearby fence. It was determined that fireworks from a neighbor's yard had caused the fire. No one was injured and damages were estimated at \$4,600.
- On July 4, 2010, at 9:30 p.m., the Saugus Fire Department was dispatched to a shed fire. The fire was ignited by someone lighting off fireworks. Damages were estimated at \$10,000.
- On August 21, 2010, at 10:27 p.m., the Boston Fire Department was dispatched to a building fire in an abandoned industrial warehouse. One hundred and sixty firefighters from Boston and 14 neighboring community fought the 9-alarm fire for 16 hours. Several people were using fireworks on the roofs of nearby buildings. Damages were estimated at \$1 million.
- On August 29, 2010, at 9:08 p.m., the Springfield Fire Department was dispatched to a motor vehicle fire. Someone had ignited fireworks in the passenger area of the car. No one was injured in this fire and damages were estimated at \$1,000.

M-BIRS facts!

In the past decade (2001-2010), 43 people have been treated at Massachusetts emergency rooms for severe burn injuries from fireworks – burns covering 5% or more of the body. Almost two-thirds, or sixty-five percent (65%) of the victims were children under the age of 18. Twenty-three percent (23%) were between the ages of 10 and 14. During the last 10 years the oldest reported person injured by fireworks was a 52-year old man and the youngest was a six-month old boy.

- On June 9, 2010, a 52-year old Rowley, man received burns to his forearm and lower legs when fireworks exploded near him.
- On July 3, 2010, a 24-year old Springfield man received burns to 10% of his body surface area from fireworks.
- On July 3, 2010, a 41-year old Marshfield man received burns to his face and arms when the fireworks he was watching at an illegal display exploded directly in front of him.
- On July 4, 2010, a 7-year old Marshfield boy was burned on his hand when he picked up a roman candle that then exploded.

